Central York School District

Curriculum Adoption

2020/2021

K12 – Math

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Kindergarten	Kindergarten Math	Counting and Cardinality	Counts to 100 by ones and tens	Count to 100 by ones and by tens.	CC.2.1.K.A.1a	N/A
Math	Kindergarten	Kindergarten Math	Counting and Cardinality	Counts forward from a given number	Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	CC.2.1.K.A.1b	N/A
Math	Kindergarten	Kindergarten Math	Counting and Cardinality	Writes numerals 0-20 without model	Write numbers from 0 to 20 with/without a model.	CC.2.1.K.A.1c	N/A
Math	Kindergarten	Kindergarten Math	Counting and Cardinality	Writes numerals 0-20 without model	Compare two numbers between 1 and 10 presented as written numerals.	CC.2.1.K.A.3a	N/A
Math	Kindergarten	Kindergarten Math	Counting and Cardinality	Represents a number of objects with a numeral 0-20	Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	CC.2.1.K.A.2a	N/A
Math	Kindergarten	Kindergarten Math	Counting and Cardinality	Identifies how many objects are in a group up to 20	When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.	CC.2.1.K.A.2b	N/A
Math	Kindergarten	Kindergarten Math	Counting and Cardinality	Identifies how many objects are in a group up to 20	Subitize to determine how many: immediate recognition of small quantities up to ten.	CC.2.1.K.A.2c	N/A
Math	Kindergarten	Kindergarten Math	Counting and Cardinality	Identifies how many objects are in a group up to 20	Understand that each successive number name refers to a quantity that is one larger.	CC.2.1.K.A.3b	N/A
Math	Kindergarten	Kindergarten Math	Counting and Cardinality	Identifies how many objects are in a group up to 20	Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.	CC.2.1.K.A.2d	N/A
Math	Kindergarten	Kindergarten Math	Counting and Cardinality	Identifies how many objects are in a group up to 20	Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.	CC.2.1.K.A.2e	N/A
Math	Kindergarten	Kindergarten Math	Counting and Cardinality	Identifies how many objects are in a group up to 20	Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.	CC.2.1.K.A.2f	N/A
Math	Kindergarten	Kindergarten Math	Place Value	Shows a number 11-19 by putting together tens and ones	Compose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 +8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	CC.2.1.K.B.1a	N/A
Math	Kindergarten	Kindergarten Math	Place Value	Shows a number 11-19 by taking apart tens and ones	Decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 +8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	CC.2.1.K.B.1b	N/A
Math	Kindergarten	Kindergarten Math	Place Value	Uses strategies to solve word problems related to place value	Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	CC.2.2.K.A.1a	N/A
Math	Kindergarten	Kindergarten Math	Addition	Represents addition with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, or equations	Represent addition with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	CC.2.2.K.A.1b1	N/A
Math	Kindergarten	Kindergarten Math	Subtraction	Represents subtraction with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, or equations	Represent subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	CC.2.2.K.A.1b2	N/A
Math	Kindergarten	Kindergarten Math	Addition	Fluently adds within 5	Fluently add within 5.	CC.2.2.K.A.1c	N/A
Math	Kindergarten	Kindergarten Math	Subtraction	Fluently subtracts within 5	Fluently subtract within 5.	CC.2.2.K.A.1d	N/A
Math	Kindergarten	Kindergarten Math	Subtraction	Shows a number in a variety of ways	Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).	CC.2.2.K.A.1e2	N/A
Math	Kindergarten	Kindergarten Math	Addition	Shows a number in a variety of ways	Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).	CC.2.2.K.A.1e1	N/A
Math	Kindergarten	Kindergarten Math	Addition	Uses strategies of using objects or drawing pictures to add and subtract within 10	For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.	CC.2.2.K.A.1f1	N/A
Math	Kindergarten	Kindergarten Math	Subtraction	Uses strategies of using objects or drawing pictures to add and subtract within 10	For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.	CC.2.2.K.A.1f2	N/A

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Kindergarten	Kindergarten Math	Addition	Solves word problems within 10	Solve addition word problems, and add within 10, e.g., by using objects or drawings to represent the problem.	CC.2.2.K.A.1g1	N/A
Math	Kindergarten	Kindergarten Math	Subtraction	Solves word problems within 10	Solve subtraction word problems, and subtract within 10, e.g., by using objects or drawings to represent the problem.	CC.2.2.K.A.1g2	N/A
Math	Kindergarten	Kindergarten Math	Geometry	Describes flat and solid shapes	Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.	CC.2.3.K.A.1a	N/A
Math	Kindergarten	Kindergarten Math	Geometry	Describes flat and solid shapes	Correctly name shapes regardless of their orientations or overall size.	CC.2.3.K.A.1b	N/A
Math	Kindergarten	Kindergarten Math	Geometry	Describes flat and solid shapes	Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).	CC.2.3.K.A.1c	N/A
Math	Kindergarten	Kindergarten Math	Geometry	Describes flat and solid shapes	Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e. g., number of sides and vertices/“corners”) and other attributes (e.g., having sides of equal length).	CC.2.3.K.A.2a	N/A
Math	Kindergarten	Kindergarten Math	Geometry	Uses simple shapes to make larger shapes	Compose simple shapes to form larger shapes. For example, “Can you join these two triangles with full sides touching to make a rectangle?”	CC.2.3.K.A.2b	N/A
Math	Kindergarten	Kindergarten Math	Geometry	Uses simple shapes to make larger shapes	Model shapes in the world by building shapes from components (e.g., sticks and clay balls) or drawing simple shapes (circle, square, triangle).	CC.2.3.K.A.2c	N/A
Math	Kindergarten	Kindergarten Math	Measurement and Data	Identifies longer, shorter, or equal to with two objects	Describe measurable attributes of objects, such as length. Describe several measurable attributes of a single object.	CC.2.4.K.A.1a	N/A
Math	Kindergarten	Kindergarten Math	Measurement and Data	Identifies longer, shorter, or equal to with two objects	Directly compare two objects with a measurable attribute (length) in common, to see which object has “more of”/“less of” the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.	CC.2.4.K.A.1b	N/A
Math	Kindergarten	Kindergarten Math	Measurement and Data	Identifies heavier, lighter, or equal to with two objects	Describe measurable attributes of objects, such as weight. Describe several measurable attributes of a single object.	CC.2.4.K.A.1c	N/A
Math	Kindergarten	Kindergarten Math	Measurement and Data	Identifies heavier, lighter, or equal to with two objects	Directly compare two objects with a measurable attribute (mass) in common, to see which object has “more of”/“less of” the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.	CC.2.4.K.A.1d	N/A
Math	Kindergarten	Kindergarten Math	Measurement and Data	Classifies objects into categories	Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10)	CC.2.4.K.A.4a	N/A
Math	Grade 1	Grade 1 Math	Place Value	Continues counting from a given number up to 120	Count to 120, starting at any number less than 120.	CC.2.1.1.B.1a	N/A
Math	Grade 1	Grade 1 Math	Place Value	Reads and writes numbers in tens and ones up to 120	Read numerals to 120.	CC.2.1.1.B.1b	N/A
Math	Grade 1	Grade 1 Math	Place Value	Reads and writes numbers in tens and ones up to 120	Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: a. 10 can be thought of as a bundle of ten ones — called a “ten.” b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).	CC.2.1.1.B.1c	N/A
Math	Grade 1	Grade 1 Math	Place Value	Reads and writes numbers in tens and ones up to 120	Write numerals to 120.	CC.2.1.1.B.1d	N/A
Math	Grade 1	Grade 1 Math	Place Value	Reads and writes numbers in tens and ones up to 120	Represent a number of objects with a written numeral to 120.	CC.2.1.1.B.1e	N/A
Math	Grade 1	Grade 1 Math	Place Value	Compares two-digit numbers	Compare 2 two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	CC.2.1.1.B.2a	N/A
Math	Grade 1	Grade 1 Math	Place Value	Uses place value concepts to add and subtract within 100	Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	CC.2.1.1.B.3a	N/A

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Math	Grade 1	Grade 1 Math	Place Value	Uses place value concepts to add and subtract within 100	Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	CC.2.1.1.B.3b	N/A
Math	Grade 1	Grade 1 Math	Place Value	Uses place value concepts to add and subtract within 100	Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	CC.2.1.1.B.3c	N/A
Math	Grade 1	Grade 1 Math	Addition	Uses strategies to add and subtract within 20	Relate counting to addition (e.g., by counting on 2 to add 2).	CC.2.2.1.A.1a1	N/A
Math	Grade 1	Grade 1 Math	Subtraction	Uses strategies to add and subtract within 20	Relate counting to subtraction (e.g., by counting up to reach the subtrahend).	CC.2.2.1.A.1a2	N/A
Math	Grade 1	Grade 1 Math	Addition	Uses strategies to add and subtract within 20	Understand the meaning of the equal sign, and determine if equations involving addition are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.	CC.2.2.1.A.1b1	N/A
Math	Grade 1	Grade 1 Math	Subtraction	Uses strategies to add and subtract within 20	Understand the meaning of the equal sign, and determine if equations involving subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.	CC.2.2.1.A.1b2	N/A
Math	Grade 1	Grade 1 Math	Addition	Uses strategies to add and subtract within 20	Add within 20. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).	CC.2.2.1.A.1c1	N/A
Math	Grade 1	Grade 1 Math	Subtraction	Uses strategies to add and subtract within 20	Subtract within 20. Use strategies such as counting up; decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).	CC.2.2.1.A.1c2	N/A
Math	Grade 1	Grade 1 Math	Addition	Uses strategies to add and subtract within 20	Apply properties of operations as strategies to add. Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)	CC.2.2.1.A.2a1	N/A
Math	Grade 1	Grade 1 Math	Subtraction	Uses strategies to add and subtract within 20	Apply properties of operations as strategies to subtract. Examples: If 11 - 3 = 8 is known, then 11 - 8 = 3 is also known. If you subtract zero from a number the answer is always that number: 8 - 0 = 8 (Zero property of subtraction)	CC.2.2.1.A.2a2	N/A
Math	Grade 1	Grade 1 Math	Addition	Fluently adds within 10	Add within 20, demonstrating fluency for addition within 10.	CC.2.2.1.A.1d	N/A
Math	Grade 1	Grade 1 Math	Subtraction	Fluently subtracts within 10	Subtract within 20, demonstrating fluency for addition and subtraction within 10.	CC.2.2.1.A.1e	N/A
Math	Grade 1	Grade 1 Math	Subtraction	Uses the relationship between addition and subtraction to add and subtract within 20	Understand subtraction as an unknown-addend problem. For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.	CC.2.2.1.A.2b	N/A
Math	Grade 1	Grade 1 Math	Addition	Uses the relationship between addition and subtraction to add and subtract within 20	Determine the unknown whole number in an addition equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 + ? =11; 5 =? - 3; 6 +6 =?	CC.2.2.1.A.2c1	N/A
Math	Grade 1	Grade 1 Math	Subtraction	Uses the relationship between addition and subtraction to add and subtract within 20	Determine the unknown whole number in a subtraction equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 + ? =11; 5 =? - 3; 6 +6 =?	CC.2.2.1.A.2c2	N/A
Math	Grade 1	Grade 1 Math	Problem Solving	Solves word problems within 20	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart,and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	CC.2.2.1.A.2d	N/A
Math	Grade 1	Grade 1 Math	Problem Solving	Solves word problems within 20	Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	CC.2.2.1.A.2e	N/A
Math	Grade 1	Grade 1 Math	Geometry	Describes attributes of two-dimensional shapes	Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.	CC.2.3.1.A.1a	N/A

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 1	Grade 1 Math	Geometry	Describes attributes of three-dimensional shapes	Distinguish between defining attributes of three dimensional shapes versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.	CC.2.3.1.A.1b	N/A
Math	Grade 1	Grade 1 Math	Geometry	Uses two-dimensional shapes to make other two-dimensional shapes	Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) to create a composite shape, and compose new shapes from the composite shape.	CC.2.3.1.A.1c	N/A
Math	Grade 1	Grade 1 Math	Geometry	Uses three-dimensional shapes to make other three-dimensional shapes	Compose three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.	CC.2.3.1.A.1d	N/A
Math	Grade 1	Grade 1 Math	Geometry	Divides circles and rectangles into two and four equal parts	Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.	CC.2.3.1.A.2a	N/A
Math	Grade 1	Grade 1 Math	Money	Identifies coins (penny, nickel, dime, and quarter)	Students will name and tell the value of a penny, nickel, dime and quarter.	CC.2.4.2.A.3a	N/A
Math	Grade 1	Grade 1 Math	Money	Counts pennies by ones	Students will count by ones using pennies.	CC.2.4.2.A.3b	N/A
Math	Grade 1	Grade 1 Math	Money	Counts nickels by fives	Students will count by fives using nickels.	CC.2.4.2.A.3c	N/A
Math	Grade 1	Grade 1 Math	Money	Counts dimes by tens	Students will count by tens using dimes.	CC.2.4.2.A.3d	N/A
Math	Grade 1	Grade 1 Math	Money	Compares values in groups of same set coins (eg. nickels to dimes or pennies to nickels, etc.)	Students will compare sets of same set coins (nickels to dimes or pennies to nickels [ie value of 10 pennies is less than value of 4 nickels])	CC.2.4.2.A.3e	N/A
Math	Grade 1	Grade 1 Math	Measurement (Time)	Tells and writes time to the hour using analog and digital clocks	Tell and write time in hours using analog and digital clocks.	CC.2.4.1.A.2a	N/A
Math	Grade 1	Grade 1 Math	Measurement (Time)	Tells and writes time to the half-hour using analog and digital clocks	Tell and write time in half-hours using analog and digital clocks.	CC.2.4.1.A.2b	N/A
Math	Grade 1	Grade 1 Math	Measurement (Length)	Uses nonstandard units to accurately measure length	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.	CC.2.4.1.A.1a	N/A
Math	Grade 1	Grade 1 Math	Measurement (Length)	Compares the lengths of two objects indirectly by using a third object	Order three objects by length; compare the lengths of two objects indirectly by using a third object.	CC.2.4.1.A.1b	N/A
Math	Grade 1	Grade 1 Math	Represent and Interpret Data	Organizes, represents, and interprets data with up to three categories	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	CC.2.4.1.A.4a	N/A
Math	Grade 2	Grade 2 Math	Place Value	Represents amounts of hundreds, tens, and ones	Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens — called a “hundred.” b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).	CC.2.1.2.B.1a	N/A
Math	Grade 2	Grade 2 Math	Place Value	Reads numbers to 1000 – in standard form, word form, expanded form	Read numbers to 1000 using standard form, word form, and expanded form.	CC.2.1.2.B.2a	N/A
Math	Grade 2	Grade 2 Math	Place Value	Writes numbers to 1000 – in standard form, word form, expanded form	Write numbers to 1000 using standard form, word form, and expanded form.	CC.2.1.2.B.2b	N/A
Math	Grade 2	Grade 2 Math	Place Value	Skip counts to 1000	Count within 1000; skip-count by 5s, 10s, and 100s.	CC.2.1.2.B.2c	N/A
Math	Grade 2	Grade 2 Math	Place Value	Compares and orders three digit numbers	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.	CC.2.1.2.B.2d	N/A
Math	Grade 2	Grade 2 Math	Place Value	Uses strategies to solve word problems related to place value	Explain why addition and subtraction strategies work, using place value and the properties of operations.	CC.2.1.2.B.3a	N/A

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Math	Grade 2	Grade 2 Math	2 and 3 Digit Addition & Subtraction	Add within 1000, using concrete models or drawings and strategies based on place value	Add within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.	CC.2.1.2.B.3d	N/A
Math	Grade 2	Grade 2 Math	2 and 3 Digit Addition & Subtraction	Subtract within 1000, using concrete models or drawings and strategies based on place value	Subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.	CC.2.1.2.B.3f	N/A
Math	Grade 2	Grade 2 Math	2 and 3 Digit Addition and Subtraction	Uses strategies to add within 1000	Add within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	CC.2.2.2.A.1a	N/A
Math	Grade 2	Grade 2 Math	Addition and Subtraction	Uses strategies to add within 1000	Add up to four two-digit numbers using strategies based on place value and properties of operations.	CC.2.2.2.A.1b	N/A
Math	Grade 2	Grade 2 Math	2 and 3 Digit Addition and Subtraction	Uses strategies to add within 1000	Add within 1000.	CC.2.2.2.A.1c	N/A
Math	Grade 2	Grade 2 Math	Place Value	Uses strategies to add within 1000	Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.	CC.2.2.2.A.2	N/A
Math	Grade 2	Grade 2 Math	2 and 3 Digit Addition and Subtraction	Uses strategies to subtract within 100	Subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	CC.2.2.2.A.1d	N/A
Math	Grade 2	Grade 2 Math	2 and 3 Digit Addition and Subtraction	Uses strategies to subtract within 1000	Subtract within 1000.	CC.2.2.2.A.1e	N/A
Math	Grade 2	Grade 2 Math	Addition and Subtraction - Facts to 20	Fluently adds within 20	Fluently add within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.	CC.2.2.2.A.2a	N/A
Math	Grade 2	Grade 2 Math	Addition and Subtraction - Facts to 20	Fluently adds within 20	Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.	CC.2.2.2.A.3a	N/A
Math	Grade 2	Grade 2 Math	Addition and Subtraction - Facts to 20	Fluently subtracts within 20	Fluently subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.	CC.2.2.2.A.2b	N/A
Math	Grade 2	Grade 2 Math	2 and 3 Digit Addition and Subtraction	Add up to four two-digit numbers	Add up to four two-digit numbers using strategies based on place value and properties of operations.	CC.2.1.2.B.3e	N/A
Math	Grade 2	Grade 2 Math	2 and 3 Digit Addition and Subtraction	Uses strategies to solve word problems within 100	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	CC.2.2.2.A.1f	N/A
Math	Grade 2	Grade 2 Math	Multiplication	Uses repeated addition to find total number of objects	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.	CC.2.2.2.A.3b	N/A
Math	Grade 2	Grade 2 Math	Geometry	Names shapes by number of sides and vertices (corners)	Recognize triangles, quadrilaterals, pentagons, hexagons having specified attributes, such as a given number of angles.	CC.2.3.2.A.1a	N/A
Math	Grade 2	Grade 2 Math	Geometry	Sorts two-dimensional shapes using number of sides and angles	Identify and sort shapes (triangles, quadrilaterals, pentagons, hexagons, and cubes) having specified attributes, such as a given number of angles or a given number of equal faces.	CC.2.3.2.A.1b	N/A
Math	Grade 2	Grade 2 Math	Geometry	Partitions a rectangle into rows and columns of same size	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	CC.2.3.2.A.2a	N/A
Math	Grade 2	Grade 2 Math	Geometry	Recognize and draw two dimensional shapes and a cube having specified attributes.	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.	CC.2.3.2.A.1c	N/A
Math	Grade 2	Grade 2 Math	Geometry	Partition circles and rectangles into two, three, or four equal parts	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	CC.2.3.2.A.2b	N/A

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 2	Grade 2 Math	Money	Shows the value of money using dollars, quarters, half dollars, dimes, nickels, and pennies	Solve money problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?	CC.2.4.2.A.3f	N/A
Math	Grade 2	Grade 2 Math	Time Measurement	Tells and writes time to the nearest five minutes using am and pm	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	CC.2.4.2.A.2a	N/A
Math	Grade 2	Grade 2 Math	Length Measurement	Uses the best tool and unit to measure length	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	CC.2.4.2.A.2b	N/A
Math	Grade 2	Grade 2 Math	Length Measurement	Measure the length	Measure the length of an object.	CC.2.4.2.A.1a	N/A
Math	Grade 2	Grade 2 Math	Length Measurement	Measure to determine how much longer one object is than anothe	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	CC.2.4.2.A.1b	N/A
Math	Grade 2	Grade 2 Math	Length Measurement	Estimates lengths using inches, feet, centimeters, and meters	Estimate lengths using units of inches, feet, centimeters, and meters.	CC.2.4.2.A.1c	N/A
Math	Grade 2	Grade 2 Math	Length Measurement	Understands the relationship between two different units of measurement	Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.	CC.2.4.2.A.1d	N/A
Math	Grade 2	Grade 2 Math	Length Measurement	Know relative sizes of measurement units within one system	know relative sizes of measurement units within one system of units including standard units (in., ft, yd, mi; oz., lb; and c, pt, qt, gal), metric units (cm, m, km; g, kg; and mL, L), and time (sec, min, hr, day, wk, mo, and yr).	CC.2.4.2.A.6a	N/A
Math	Grade 2	Grade 2 Math	Represent and Interpret Data	Analyzes pictographs, line plots, and bar graphs	Analyze a pictograph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.	CC.2.4.2.A.4a	N/A
Math	Grade 2	Grade 2 Math	Represent and Interpret Data	Draw a pictograph or a bar graph	Draw a pictograph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.	CC.2.4.2.A.4b	N/A
Math	Grade 2	Grade 2 Math	Represent and Interpret Data	Represents whole numbers as lengths on a number line	Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.	CC.2.4.2.A.4c	N/A
Math	Grade 2	Grade 2 Math	Represent and Interpret Data	Generates measurement data by measuring lengths	Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.	CC.2.4.2.A.4d	N/A
Math	Grade 3	Grade 3 Math	Place Value	Reads and writes numbers in the hundreds and thousands	Read and write whole numbers in standard, expanded and word form through 9,999.	M03.A-T.1.1.4a	N/A
Math	Grade 3	Grade 3 Math	Place Value	Compares and orders numbers up to 9,999	Compare 2 multi-digit numbers through 9,999 based on the digits in each place, using the >, =, and < symbols.	M03.A-T.1.1.4b	N/A
Math	Grade 3	Grade 3 Math	Place Value	Compares and orders numbers up to 9,999	Order a set of whole numbers from least to greatest or greatest to least (up to 9,999; limit sets to no more than 4 numbers).	M03.A-T.1.1.4c	M03.A-T.1.1.4
Math	Grade 3	Grade 3 Math	Place Value	Rounds 2-digit numbers to nearest ten and 3-digit numbers to nearest ten or hundred	Students will round 2-digit whole numbers to the nearest ten and 3-digit whole numbers to the nearest ten or hundred.	M03.A-T.1.1.1	M03.A-T.1.1.1
Math	Grade 3	Grade 3 Math	Place Value	Uses strategies to solve word problems related to place value	Apply place-value strategies to solve problems.	M03.A-T.1.1	
Math	Grade 3	Grade 3 Math	Addition	Uses strategies to add within 1000	Add 2- and 3-digit whole numbers (limit sums from 100 to 1000)	M03.A-T.1.1.2a	M03.A-T.1.1.2
Math	Grade 3	Grade 3 Math	Addition and Subtraction	Uses strategies to subtract within 1000	Students will subtract 2- and 3-digit whole numbers from 3-digit whole numbers.	M03.A-T.1.1.2b	M03.A-T.1.1.2
Math	Grade 3	Grade 3 Math	Subtraction	Uses the relationship between addition and subtraction to add and subtract	Solve problems involving subtraction and identify and explain patterns in arithmetic.	CC.2.2.3.A.4b	N/A
Math	Grade 3	Grade 3 Math	Addition	Uses the relationship between addition and multiplication to solve multiplication problems	Identify arithmetic patterns (including patterns in the addition table or multiplication table) and/or explain them using properties of operations. Example 1: Observe that 4 times a number is always even. Example 2: Explain why 6 times a number can be decomposed into three equal addends.	M03.B-O.3.1.5	M03.B-O.3.1.5

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 3	Grade 3 Math	Multiplication and Division	Uses the relationship between addition and multiplication to solve multiplication problems	Identify arithmetic patterns (including patterns in the addition table or multiplication table) and/or explain them using properties of operations. Example 1: Observe that 4 times a number is always even. Example 2: Explain why 6 times a number can be decomposed into three equal addends.	M03.B-O.3.1.5	M03.B-O.3.1.5
Math	Grade 3	Grade 3 Math	Addition	Uses the relationship between addition and multiplication to solve multiplication problems	Solve problems involving addition and multiplication, and identify and explain patterns in arithmetic.	CC.2.2.3.A.4a	N/A
Math	Grade 3	Grade 3 Math	Addition	Uses strategies to solve word problems within 1000	Represent two-step addition and subtraction word problems using equations with a symbol standing for the unknown quantity. Limit to problems with whole numbers and having whole-number answers.	M03.B-O.3.1.2a	M03.B-O.3.1.2
Math	Grade 3	Grade 3 Math	Addition	Uses strategies to solve word problems within 1000	Add or subtract to solve one- step word problems involving masses or liquid volumes that are given in the same units.	M03.D-M.1.2.2b	M03.D-M.1.2.2
Math	Grade 3	Grade 3 Math	Subtraction	Uses strategies to solve word problems within 1000	Add or subtract to solve one- step word problems involving masses or liquid volumes that are given in the same units.	M03.D-M.1.2.2b	M03.D-M.1.2.2
Math	Grade 3	Grade 3 Math	Addition	Uses rounding to estimate	Assess the reasonableness of answers using mental computation and estimation strategies including rounding. Limit problems posed with whole numbers and having whole-number answers.	M03.B-O.3.1.3	M03.B-O.3.1.3
Math	Grade 3	Grade 3 Math	Subtraction	Uses rounding to estimate	Assess the reasonableness of answers using mental computation and estimation strategies including rounding. Limit problems posed with whole numbers and having whole-number answers.	M03.B-O.3.1.3	M03.B-O.3.1.3
Math	Grade 3	Grade 3 Math	Multiplication and Division	Uses the relationship between multiplication and division to multiply and divide	Identify the missing symbol (×, ÷, <, >, =) that makes a number sentence true.	M03.B-O.3.1.7	M03.B-O.3.1.7
Math	Grade 3	Grade 3 Math	Multiplication and Division	Uses strategies to multiply within 100	Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.	M03.A-T.1.1.3	
Math	Grade 3	Grade 3 Math	Multiplication and Division	Uses strategies to divide within 100	Solve two-step equations using order of operations (equation is explicitly stated with no grouping symbols). (i.e. 2 + 3 x 6 = Step 1: 3 x 6 = 18 Step 2: 18 +2 = 20) **Reminder - multiplication and division whichever come first in problem, then addition and subtraction, whichever comes first.	M03.B-O.3.1.4	M03.B-O.3.1.4
Math	Grade 3	Grade 3 Math	Multiplication and Division	Fluently multiplies within 100	Fluently multiply within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	CC.2.2.3.A.1a	
Math	Grade 3	Grade 3 Math	Multiplication and Division	Fluently multiplies within 100	Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7.	M03.B-O.1.1.1	M03.B-O.1.1.1
Math	Grade 3	Grade 3 Math	Multiplication and Division	Fluently multiplies within 100	Apply the commutative property of multiplication. Example: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known.	M03.B-O.2.1.1	M03.B-O.2.1.1
Math	Grade 3	Grade 3 Math	Multiplication and Division	Fluently multiplies within 100	Apply the associative property of multiplication Example: 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30	M03.B-O.2.1.2	M03.B-O.2.1.2
Math	Grade 3	Grade 3 Math	Multiplication and Division	Fluently multiplies within 100	Apply the distributive property of multiplication Example: Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56	CYM03.B-O.2.1.3	N/A
Math	Grade 3	Grade 3 Math	Multiplication and Division	Fluently divides within 100	Fluently divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	CC.2.2.3.A.1b	
Math	Grade 3	Grade 3 Math	Multiplication and Division	Fluently divides within 100	Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.	M03.B-O.1.1.2	M03.B-O.1.1.2
Math	Grade 3	Grade 3 Math	Multiplication and Division	Fluently divides within 100	Apply properties of operations as strategies to divide.	CYM03.B-O.2.1.4	N/A
Math	Grade 3	Grade 3 Math	Multiplication and Division	Uses the relationship between multiplication and division to multiply and divide	Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.	M03.B-O.2.2.1	M03.B-O.2.2.1
Math	Grade 3	Grade 3 Math	Multiplication and Division	Uses the relationship between multiplication and division to multiply and divide	Solve problems involving multiplication and division and identify and explain patterns in arithmetic.	CC.2.2.3.A.4c	N/A

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 3	Grade 3 Math	Multiplication and Division	Uses the relationship between multiplication and division to multiply and divide	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8× ? = 48, 5 = □÷3, 6 × 6 = ?.	M03.B-O.1.2.2	M03.B-O.1.2.2
Math	Grade 3	Grade 3 Math	Multiplication and Division	Uses strategies to solve word problems related to multiplication and division within 100	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	M03.B-O.1.2.1	M03.B-O.1.2.1
Math	Grade 3	Grade 3 Math	Multiplication and Division	Uses strategies to solve word problems related to multiplication and division within 100	Create or match a story to a given combination of symbols (+, –, ×, ÷, <, >, =) and numbers.	M03.B-O.3.1.6	M03.B-O.3.1.6
Math	Grade 3	Grade 3 Math	Multiplication and Division	Uses strategies to solve word problems related to multiplication and division within 100	Represent two-step multiplication and division word problems using equations with a symbol standing for the unknown quantity. Limit to problems with whole numbers and having whole-number answers.	M03.B-O.3.1.2b	M03.B-O.3.1.2
Math	Grade 3	Grade 3 Math	Problem Solving	Uses strategies to solve word problems related to multiplication and division within 100	Solve two-step word problems using the four operations (expressions are not explicitly stated). Limit to problems with whole numbers and having whole-number answers.	M03.B-O.3.1.1	M03.B-O.3.1.1
Math	Grade 3	Grade 3 Math	Multiplication and Division	Uses strategies to solve word problems related to multiplication and division within 100	Multiply, and divide to solve one- step word problems involving masses or liquid volumes that are given in the same units.	M03.D-M.1.2.2a	M03.D-M.1.2.2
Math	Grade 3	Grade 3 Math	Geometry	Understands attributes of shapes	Explain that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Example 1: A rhombus and a rectangle are both quadrilaterals since they both have exactly four sides. Example 2: A triangle and a pentagon are both polygons since they are both multi-sided plane figures.	M03.C-G.1.1.1	M03.C-G.1.1.1
Math	Grade 3	Grade 3 Math	Geometry	Understands attributes of shapes	Recognize rhombi, rectangles, and squares as examples of quadrilaterals, and/or draw examples of quadrilaterals that do not belong to any of these subcategories.	M03.C-G.1.1.2	M03.C-G.1.1.2
Math	Grade 3	Grade 3 Math	Geometry	Understands how to break apart shapes into equal parts	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.	M03.C-G.1.1.3	M03.C-G.1.1.3
Math	Grade 3	Grade 3 Math	Fractions	Demonstrates representation of fractions	Demonstrate that when a whole or set is partitioned into y equal parts, the fraction 1/y represents 1 part of the whole and/or the fraction x/y represents x equal parts of the whole (limit denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; and no simplification necessary).	M03.A-F.1.1.1	M03.A-F.1.1.1
Math	Grade 3	Grade 3 Math	Fractions	Demonstrates representation of fractions	Represent fractions on a number line (limit denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; and no simplification necessary).	M03.A-F.1.1.2	M03.A-F.1.1.2
Math	Grade 3	Grade 3 Math	Fractions		Compare two fractions with the same denominator, using the symbols >, =, or <, and/or justify the conclusions.	M03.A-F.1.1.5	
Math	Grade 3	Grade 3 Math	Fractions	Understands how fractions are like or unlike whole numbers	Express whole numbers as fractions, and/or generate fractions that are equivalent to whole numbers (limit denominators to 1, 2, 3, 4, 6, and 8).	M03.A-F.1.1.4	M03.A-F.1.1.4
Math	Grade 3	Grade 3 Math	Fractions	Compares fractions	Recognize and generate simple equivalent fractions (limit the denominators to 1, 2, 3, 4, 6, and 8 and limit numerators to whole numbers less than the denominator). Example 1: 1/2 = 2/4 Example 2: 4/6 = 2/3	M03.A-F.1.1.3	M03.A-F.1.1.3
Math	Grade 4	Grade 3 Math	Fractions	Compares fractions	Compare two fractions with the same denominator, using the symbols >, =, or <, and/or justify the conclusions.	M03.A-F.1.1.5	M03.A-F.1.1.5
Math	Grade 3	Grade 3 Math	Money	Compares values of combinations of coins (penny, nickel, dime, and quarter) and/or dollar bills less than $5.00	Compare total values of combinations of coins (penny, nickel, dime, and quarter) and/or dollar bills less than $5.00.	M03.D-M.1.3.1	M03.D-M.1.3.1
Math	Grade 3	Grade 3 Math	Money	Makes change for an amount up to $5.00 with no more that $2.00 in change	Make change for an amount up to $5.00 with no more than $2.00 change given (penny, nickel, dime, quarter, and dollar).	M03.D-M.1.3.2	M03.D-M.1.3.2
Math	Grade 3	Grade 3 Math	Money	Rounds amounts of money to nearest dollar	Round amounts of money to the nearest dollar.	M03.D-M.1.3.3	M03.D-M.1.3.3
Math	Grade 3	Grade 3 Math	Measurement and Data	Tells, shows, and writes time to the nearest minute	Tell, show, and/or write time (analog) to the nearest minute.	M03.D-M.1.1.1	M03.D-M.1.1.1
Math	Grade 3	Grade 3 Math	Measurement and Data	Calculates elapsed time to the minute	Calculate elapsed time to the minute in a given situation (total elapsed time limited to 60 minutes or less).	M03.D-M.1.1.2	M03.D-M.1.1.2

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 3	Grade 3 Math	Measurement and Data	Measures and estimates liquid volumes and masses using cups, pints, gallons, ounces, pounds, liters, grams, and kilograms	Measure and estimate liquid volumes and masses of objects using standard units (cups [c], pints [pt], quarts [qt], gallons [gal], ounces [oz.], and pounds [lb]) and metric units (liters [l], grams [g], and kilograms [kg]).	M03.D-M.1.2.1	M03.D-M.1.2.1
Math	Grade 3	Grade 3 Math	Measurement and Data	Measures and estimates liquid volumes and masses using cups, pints, gallons, ounces, pounds, liters, grams, and kilograms	Solve one- step word problems involving masses or liquid volumes that are given in the same units.	M03.D-M.1.2.2c	M03.D-M.1.2.2
Math	Grade 3	Grade 3 Math	Measurement and Data	Measures lengths accurately to nearest one-fourth inch or centimeter	Use a ruler to measure lengths to the nearest quarter inch or centimeter.	M03.D-M.1.2.3	M03.D-M.1.2.3
Math	Grade 3	Grade 3 Math	Measurement and Data	Solves problems with finding the perimeter	Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, exhibiting rectangles with the same perimeter and different areas, and exhibiting rectangles with the same area and different perimeters. Use the same units throughout the problem.	M03.D-M.4.1.1	M03.D-M.4.1.1
Math	Grade 3	Grade 3 Math	Measurement and Data	Uses pictographs, tally charts, bar graphs, and tables	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Display the data by making a line plot, where the horizontal scale is marked in appropriate units—whole numbers, halves, or quarters.	M03.D-M.2.1.3	M03.D-M.2.1.3
Math	Grade 4	Grade 4 Math	Place Value	Read/write whole numbers in standard, expanded, word form through 1,000,000	Read and write whole numbers in standard, expanded and word form through 1,000,000.	M04.A-T.1.1.2	M04.A-T.1.1.2
Math	Grade 4	Grade 4 Math	Place Value		Demonstrate an understanding that in a multi-digit number, through 1,000,000, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	M04.A-T.1.1.1	M04.A-T.1.1.1
Math	Grade 4	Grade 4 Math	Place Value	Compare two numbers through 1,000,000 using greater than, less than, or equal to symbols.	Compare two multi-digit numbers through 1,000,000 based on the meanings of the digits in each place, using >, =, and < symbols.	M04.A-T.1.1.3	M04.A-T.1.1.3
Math	Grade 4	Grade 4 Math	Place Value	Round multi-digit whole numbers (through 1,000,000) to any place	Round multi-digit whole numbers (through 1,000,000) to any place.	M04.A-T.1.1.4	M04.A-T.1.1.4
Math	Grade 4	Grade 4 Math	Addition and Subtraction	Add multi-digit whole numbers up to and including 1,000,000	Add multi-digit whole numbers (limit sums and subtrahends up to and including 1,000,000).	M04.A-T.2.1.1a	M04.A-T.2.1.1
Math	Grade 4	Grade 4 Math	Addition and Subtraction	Subtract multi-digit whole numbers up to and including 1,000,000	Subtract multi-digit whole numbers (limit sums and subtrahends up to and including 1,000,000).	M04.A-T.2.1.1b	M04.A-T.2.1.1
Math	Grade 4	Grade 4 Math	Addition and Subtraction	Estimate the answer to addition and subtraction problems using whole numbers through six digits	Estimate the answer to addition and subtraction problems using whole numbers through six digits (for multiplication, no more than 2 digits × 1 digit, excluding powers of 10).	M04.A-T.2.1.4a	M04.A-T.2.1.4
Math	Grade 4	Grade 4 Math	Multiplication	Fluently computes multiplication facts 0-12.	Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations.Example 1: Interpret 35 = 5 × 7 as a statement that35 is 5 times as many as 7 and 7 times as manyas 5.Example 2: Know that the statement 24 is 3 timesas many as 8 can be represented by the equation24 = 3 × 8 or 24 = 8 × 3.	M04.B-O.1.1.1	M04.B-O.1.1.1
Math	Grade 4	Grade 4 Math	Multiplication	Determine mutliples of a whole number.	Find all factor pairs for a whole number in the interval 1 through 100. Recognize that a whole number is a multiple of each of its factors.Determine whether a given whole number in the interval 1 through 100 is prime or composite.	M04.B-O.2.1.1a	M04.B-O.2.1.1
Math	Grade 4	Grade 4 Math	Multiplication	Estimate the product of two digit by one digit multiplication problem	Estimate the answer to multiplication problems using whole numbers through six digits (for multiplication, no more than 2 digits × 1 digit, excluding powers of 10).	M04.A-T.2.1.4b	M04.A-T.2.1.4
Math	Grade 4	Grade 4 Math	Multiplication	Find all multiples for whole numbers up to 100	Determine whether a given one-digit number in the interval 1 through 100 is a multiple of a given one-digit number.	M04.B-O.2.1.1b	M04.B-O.2.1.1
Math	Grade 4	Grade 4 Math	Multiplication	Multiply four digit number by one digit number	Multiply a whole number of up to four digits by a one-digit whole number and multiply 2 two-digit numbers.	M04.A-T.2.1.2a	M04.A-T.2.1.2
Math	Grade 4	Grade 4 Math	Multiplication	Multiply a two digit number by a two digit number	Multiply 2 two-digit numbers.	M04.A-T.2.1.2b	M04.A-T.2.1.2
Math	Grade 4	Grade 4 Math	Division	Find all factor pairs for whole numbers up to 100.	Find all factor pairs for a whole number in the interval 1 through 100. Recognize that a whole number is a multiple of each of its factors.Determine whether a given whole number in the interval 1 through 100 is prime or composite.	M04.B-O.2.1.1c	M04.B-O.2.1.1
Math	Grade 4	Grade 4 Math	Division	Divide four digit number by one digit number with and without remainders	Divide up to four-digit dividends by one-digit divisors with answers written as whole-number quotients and remainders.	M04.A-T.2.1.3	M04.A-T.2.1.3

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 4	Grade 4 Math	Fractions (Adding & Subtracting)	Recognize and generate equivalent fractions	Recognize and generate equivalent fractions.	M04.A-F.1.1.1	M04.A-F.1.1.1
Math	Grade 4	Grade 4 Math	Fractions (Adding & Subtracting)	Decompose a fraction or a mixed number into a sum of fractions with the same denominator. (Example 1: 3/8 = 1/8 + 1/8 + 1/8 OR 3/8 = 1/8 + 2/8 – Example 2: 2 1/12 = 1 + 1 + 1/12 =12/12 + 12/12 + 1/12)	Decompose a fraction or a mixed number into a sum of fractions with the same denominator(denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and100), recording the decomposition by an equation.Justify decompositions (for example, by using avisual fraction model).	M04.A-F.2.1.2	M04.A-F.2.1.2
Math	Grade 4	Grade 4 Math	Fractions (Adding & Subtracting)	Compare two fractions with different numerators and different denominators.	Compare two fractions with different numerators and different denominators (denominators limitedto 2, 3, 4, 5, 6, 8, 10, 12, and 100) using the symbols >, =, or <, and justify the conclusions.	M04.A-F.1.1.2	M04.A-F.1.1.2
Math	Grade 4	Grade 4 Math	Fractions (Adding & Subtracting)	Add fractions with a common denominator	Add fractions with a common denominator (denominators limited to 2, 3, 4, 5, 6,8, 10, 12, and 100; answers do not need to be reduced; no improper fractions as the final answer).	M04.A-F.2.1.1a	M04.A-F.2.1.1
Math	Grade 4	Grade 4 Math	Fractions (Adding & Subtracting)		Add two fractions with respective denominators 10 and 100. Example: Express 3/10 as 30/100, and add 3/10 + 4/100 = 30/100 + 4/100 = 34/100.	M04.A-F.3.1.1	M04.A-F.3.1.1
Math	Grade 4	Grade 4 Math	Fractions (Adding & Subtracting)	Subtract fractions with a common denominator	Subtract fractions with a common denominator (denominators limited to 2, 3, 4, 5, 6,8, 10, 12, and 100; answers do not need to bereduced; no improper fractions as the final answer).	M04.A-F.2.1.1b	M04.A-F.2.1.1
Math	Grade 4	Grade 4 Math	Fractions (Adding & Subtracting)	Add mixed numbers with a common denominator	Add mixed numbers with a common denominator (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100; no regrouping with subtraction;fractions do not need to be reduced; no improperfractions as the final answers).	M04.A-F.2.1.3a	M04.A-F.2.1.3
Math	Grade 4	Grade 4 Math	Fractions (Adding & Subtracting)	Subtract mixed numbers with a common denominator	Subtract mixed numbers with a common denominator (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100; no regrouping with subtraction; fractions do not need to be reduced; no improper fractions as the final answers).	M04.A-F.2.1.3b	M04.A-F.2.1.3
Math	Grade 4	Grade 4 Math	Fractions (Decimals, Multiplying & Line Plots)	Compare two decimals to hundredths.	Compare two decimals to hundredths using the symbols >, =, or <, and justify the conclusions.	M04.A-F.3.1.3	M04.A-F.3.1.3
Math	Grade 4	Grade 4 Math	Fractions (Decimals, Multiplying & Line Plots)	Recognize fractions as decimals (only with denominators of 10 or 100)	Use decimal notation for fractions with denominators 10 or 100.Example: Rewrite 0.62 as 62/100 and vice versa.	M04.A-F.3.1.2	M04.A-F.3.1.2
Math	Grade 4	Grade 4 Math	Fractions (Decimals, Multiplying & Line Plots)	Multiply a whole number by a non-unit fraction. (Example: 3 × (5/6) = 15/6)	Multiply a whole number by a non-unit fraction(denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and100; final answers do not need to be reduced orwritten as a mixed number). Example: 3 × (5/6) = 15/6	M04.A-F.2.1.6	M04.A-F.2.1.6
Math	Grade 4	Grade 4 Math	Fractions (Decimals, Multiplying & Line Plots)	Make a line plot to display a data set of measurements in fractions of a unit	Make a line plot to display a data set of measurements in fractions of a unit (e.g., intervals of 1/2, 1/4, or 1/8).	M04.D-M.2.1.1	M04.D-M.2.1.1
Math	Grade 4	Grade 4 Math	Measurement & Data	Translate information from one type of display to another (table, chart, bar graph, pictograph)	Translate information from one type of display to another (table, chart, bar graph, or pictograph).	M04.D-M.2.1.3	M04.D-M.2.1.3
Math	Grade 4	Grade 4 Math	Measurement & Data	Know relative sizes of units of measurement for length, volume, mass, and time.	Know relative sizes of measurement units within one system of units including standard units (in., ft, yd, mi; oz., lb; and c, pt, qt, gal), metric units (cm, m, km; g, kg; and mL, L), and time (sec, min, hr, day, wk, mo, and yr).	M04.D-M.1.1.1a	M04.D-M.1.1.1
Math	Grade 4	Grade 4 Math	Measurement & Data	Convert and compare measurements that are one unit larger or smaller (Example: feet-inches, ounces-pounds, minute-hour)	Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. A table of equivalencies will be provided.	M04.D-M.1.1.1b	M04.D-M.1.1.1
Math	Grade 4	Grade 4 Math	Measurement & Data	Identify time as the number of minutes before or after the hour.	Identify time (analog or digital) as the amount of minutes before or after the hour.	M04.D-M.1.1.4	M04.D-M.1.1.4
Math	Grade 4	Grade 4 Math	Geometry	Apply the area and perimeter formulas for rectangles in real-world and mathematical problems	Apply the area and perimeter formulas for rectangles in real-world and mathematical problems (may include finding a missing side length). Whole numbers only. The formulas will be provided.	M04.D-M.1.1.3	M04.D-M.1.1.3
Math	Grade 4	Grade 4 Math	Geometry	Draw and identify points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines in two-dimensional figures.	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	M04.C-G.1.1.1	M04.C-G.1.1.1

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 4	Grade 4 Math	Geometry	Classify two-dimensional figures based on types of lines and angles.	Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.	M04.C-G.1.1.2	M04.C-G.1.1.2
Math	Grade 4	Grade 4 Math	Geometry	Recognize, identify, and draw a line of symmetry in two-dimensional figures.	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into mirroring parts. Identify line-symmetric figures and draw lines of symmetry (up to two lines of symmetry).	M04.C-G.1.1.3	M04.C-G.1.1.3
Math	Grade 4	Grade 4 Math	Geometry	Measure angles to the nearest degree using a protractor.	Measure angles in whole number degrees using a protractor. With the aid of a protractor, sketch angles of specified measure.	M04.D-M.3.1.1	M04.D-M.3.1.1
Math	Grade 4	Grade 4 Math	Geometry	Measure angles to the nearest degree using a protractor.	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a “one-degree angle,” and can be used to measure angles. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.	CYM04.C-G.1.1.4	N/A
Math	Grade 4	Grade 4 Math	Geometry	Measure angles to the nearest degree using a protractor.	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	CYM04.C-G.1.1.5	N/A
Math	Grade 4	Grade 4 Math	Problem Solving	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Use the four operations to solve word problems involving distances, intervals of time (such as elapsed time), liquid volumes, masses of objects; money, including problems involving simple fractions or decimals; and problems that require expressing measurements given in a larger unit in terms of a smaller unit.	M04.D-M.1.1.2	M04.D-M.1.1.2
Math	Grade 4	Grade 4 Math	Problem Solving	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Solve multi-step word problems posed with whole numbers using the four operations. Answers will be either whole numbers or have remainders that must be interpreted yielding a final answer that is a whole number. Represent these problems using equations with a symbol or letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	M04.B-O.1.1.3	M04.B-O.1.1.3
Math	Grade 4	Grade 4 Math	Problem Solving	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Multiply or divide to solve word problems involving multiplicative comparison, distinguishing multiplicative comparison from additive comparison. e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. Example: Know that 3 × 4 can be used torepresent that Student A has 4 objects andStudent B has 3 times as many objects, and notjust 3 more objects.	M04.B-O.1.1.2	M04.B-O.1.1.2
Math	Grade 4	Grade 4 Math	Problem Solving	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Solve word problems involving addition andsubtraction of fractions referring to the same wholeor set and having like denominators (denominatorslimited to 2, 3, 4, 5, 6, 8, 10, 12, and 100).	M04.A-F.2.1.4	M04.A-F.2.1.4
Math	Grade 4	Grade 4 Math	Problem Solving	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Solve problems involving addition and subtraction of fractions by using information presented in line plots (line plots must be labeled with common denominators, such as 1/4, 2/4, 3/4).	M04.D-M.2.1.2	M04.D-M.2.1.2
Math	Grade 4	Grade 4 Math	Problem Solving	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Solve word problems involving multiplication of awhole number by a fraction (denominators limitedto 2, 3, 4, 5, 6, 8, 10, 12, and 100).	M04.A-F.2.1.7	M04.A-F.2.1.7
Math	Grade 4	Grade 4 Math	Problem Solving	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems. (Angles must adjacent and non-overlapping.)	M04.D-M.3.1.2	M04.D-M.3.1.2
Math	Grade 4	Grade 4 Math	Problem Solving	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Solve one- and two-step problems using information to interpret data presented in scaled pictographs and scaled bar graphs (scales limited to 1, 2, 5, and 10).	M04D-M.2.1.2	M04D-M.2.1.2
Math	Grade 4	Grade 4 Math	Algebra		Determine the missing elements in a function table (limit to +, –, or × and to whole numbers or money).	M04.B-O.3.1.2	
Math	Grade 4	Grade 4 Math	Algebra		Determine the rule for a function given a table (limit to +, –, or × and to whole numbers).	M04.B-O.3.1.3	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 4	Grade 4 Math	Algebra		Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.	M04.B-O.3.1.1	
Math	Grade 4	Grade 4 Math	Algebra		Generate and analyze patterns using one rule.	CYCCMA.2.2.4.A.0	
Math	Grade 4	Grade 4 Math	Algebra		Identify the missing symbol (+, –, ×, ÷, =, <, >) that makes a number sentence true (single-digit divisor only).	M04.B-O.1.1.4	
Math	Grade 4	Grade 4 Math	Multiplication		Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. It is an expectation that by the end of Grade 3, students know from memory all products of two one-digit numbers, however remediation may be necessary in fourth grade.	M03.A-T.1.1.3a	
Math	Grade 5	Grade 5 Math	Place Value	Understands that in a multi-digit number, a digit in one place represents 1/10 of what it represents in the place to its left.	Demonstrate an understanding that in a multi-digit number, a digit in one place represents 1/10 of what it represents in the place to its left.	M05.A-T.1.1.1	M05.A-T.1.1.1
Math	Grade 5	Grade 5 Math	Place Value	Reads and writes decimals to the thousandths place using base-ten numerals, word form, and expanded form.	Read and write decimals to thousandths using base-ten numerals, word form, and expanded form.	M05.A-T.1.1.3	M05.A-T.1.1.3
Math	Grade 5	Grade 5 Math	Place Value	Compare two decimals to thousandths using greater than, equal, or less than symbols	Compare two decimals to thousandths based on meanings of the digits in each place using >, =, and < symbols.	M05.A-T.1.1.4	M05.A-T.1.1.4
Math	Grade 5	Grade 5 Math	Place Value	Round decimals to thousandths place	Round decimals to any place (limit rounding to ones, tenths, hundredths, or thousandths place).	M05.A-T.1.1.5	M05.A-T.1.1.5
Math	Grade 5	Grade 5 Math	Addition and Subtraction	Add decimals to hundredths	Add decimals to hundredths.	M05.A-T.2.1.3a	M05.A-T.2.1.3
Math	Grade 5	Grade 5 Math	Addition and Subtraction	Subtract decimals to hundredths	Subtract decimals to hundredths.	M05.A-T.2.1.3b	M05.A-T.2.1.3
Math	Grade 5	Grade 5 Math	Addition and Subtraction	Estimate the answer to addition and subtraction problems using whole numbers and decimals.	Assess the reasonableness of answers using mental computation and estimation strategies including rounding	CYM05.A-T.1.1.6	N/A
Math	Grade 5	Grade 5 Math	Multiplication	Multiply multi-digit whole numbers (not to exceed 3 digit by 3 digit)	Multiply multi-digit whole numbers (not to exceed three-digit by three digit).	M05.A-T.2.1.1	M05.A-T.2.1.1
Math	Grade 5	Grade 5 Math	Multiplication	Multiply decimals to hundredths	Mulitiply decimals to hundredths.	M05.A-T.2.1.3c	M05.A-T.2.1.3
Math	Grade 5	Grade 5 Math	Multiplication	Solves and explains patterns when multiplying and dividing by powers of 10	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10 and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	M05.A-T.1.1.2a	M05.A-T.1.1.2a
Math	Grade 5	Grade 5 Math	Division	Find whole number quotients of whole numbers with up to four digit dividends and two digit divisors	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors.	M05.A-T.2.1.2	M05.A-T.2.1.2
Math	Grade 5	Grade 5 Math	Division	Divide decimals to the hundredths	Divide decimals to hundredths.	M05.A-T.2.1.3d	M05.A-T.2.1.3
Math	Grade 5	Grade 5 Math	Division	Solves and explains patterns when multiplying and dividing by powers of 10	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10 and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	M05.A-T.1.1.2b	M05.A-T.1.1.2b
Math	Grade 5	Grade 5 Math	Geometry	Identify parts of the coordinate plane and the ordered pair	Identify parts of the coordinate plane (x-axis, y-axis, and the origin) and the ordered pair (x-coordinate and y-coordinate). Limit the coordinate plane to quadrant I.	M05.C-G.1.1.1	M05.C-G.1.1.1
Math	Grade 5	Grade 5 Math	Geometry	Plot points in quadrant I of the coordinate plane and interpret coordinate values of points	Represent real-world and mathematical problems by plotting points in quadrant I of the coordinate plane, and interpret coordinate values of points in the context of the situation.	M05.C-G.1.1.2	M05.C-G.1.1.2
Math	Grade 5	Grade 5 Math	Geometry	Classify two-dimensional figures in a hierarchy based on properties	Classify two-dimensional figures in a hierarchy based on properties.	M05.C-G.2.1.1	M05.C-G.2.1.1
Math	Grade 5	Grade 5 Math	Geometry	Apply the formula V=l x w x h and V = B x h to find the volume of rectangular prisms	Apply the formulas V = l × w × h and V = B × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems. Formulas will be provided.	M05.D-M.3.1.1	M05.D-M.3.1.1
Math	Grade 5	Grade 5 Math	Geometry	Find the volumes of solid figures composed of two non-overlapping right rectangular prisms	Find volumes of solid figures composed of two non-overlapping right rectangular prisms.	M05.D-M.3.1.2	M05.D-M.3.1.2

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 5	Grade 5 Math	Algebra	Use multiple grouping symbols (parentheses, brackets, and braces) in numerical expressions, and evaluate expressions containing these symbols.	Use multiple grouping symbols (parentheses, brackets, or braces) in numerical expressions, and evaluate expressions containing these symbols.	M05.B-O.1.1.1	M05.B-O.1.1.1
Math	Grade 5	Grade 5 Math	Algebra	Write simple expressions that model calculations with numbers	Write simple expressions that model calculations with numbers, and interpret numerical expressions without evaluating them.	M05.B-O.1.1.2	M05.B-O.1.1.2
Math	Grade 5	Grade 5 Math	Algebra	Generate numerical patterns using two rules	Generate two numerical patterns using two given rules.	M05.B-O.2.1.1	M05.B-O.2.1.1
Math	Grade 5	Grade 5 Math	Algebra	Identify relationships between corresponding terms of two patterns	Identify apparent relationships between corresponding terms of two patterns with the same starting numbers that follow different rules.	M05.B-O.2.1.2	M05.B-O.2.1.2
Math	Grade 5	Grade 5 Math	Fractions (Adding & Subtracting)	Add fractions, including mixed numbers, with unlike denominators	Add fractions (including mixed numbers) with unlike denominators. (May include multiple methods and representations.)	M05.A-F.1.1.1a	M05.A-F.1.1.1
Math	Grade 5	Grade 5 Math	Fractions (Adding & Subtracting)	Subtract fractions, including mixed numbers, with unlike denominators	Subtract fractions (including mixed numbers) with unlike denominators. (May include multiple methods and representations.)	M05.A-F.1.1.1b	M05.A-F.1.1.1
Math	Grade 5	Grade 5 Math	Fractions (Multiplying & Dividing)	Multiply a fraction by a fraction, including mixed numbers	Multiply a fraction (including mixed numbers) by a fractions.	M05.A-F. 2.1.2	M05.A-F.2.1.2
Math	Grade 5	Grade 5 Math	Fractions (Multiplying & Dividing)	Divide unit fractions by whole numbers and whole numbers by unit fractions	Divide unit fractions by whole numbers and whole numbers by unit fractions.	M05.A-F.2.1.4	M05.A-F.2.1.4
Math	Grade 5	Grade 5 Math	Fractions (Multiplying & Dividing)	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Solve word problems involving division of whole numbers leading to answers in the form of fractions (including mixed numbers).	M05.A-F.2.1.1	M05.A-F.2.1.1
Math	Grade 5	Grade 5 Math	Fractions (Scaling & Line Plots)	Solve problems involving computation of fractions by using information presented in line plots	Solve problems involving computation of fractions by using information presented in line plots.	M05.D-M.2.1.1	M05.D-M.2.1.1
Math	Grade 5	Grade 5 Math	Fractions (Scaling & Line Plots)	Demonstrate an understanding of multiplication as scaling (resizing)	Demonstrate an understanding of multiplication as scaling (resizing).	M05.A-F.2.1.3	M05.A-F.2.1.3
Math	Grade 5	Grade 5 Math	Measurement & Data	Convert between different-sized measurement units within a given measurement system	Convert between different-sized measurement units within a given measurement system. A table of equivalencies will be provided.	M05.D-M.1.1.1	M05.D-M.1.1.1
Math	Grade 5	Grade 5 Math	Measurement & Data	Represent and Interpret data from various charts and graphs	Display and interpret data shown in tallies, tables, charts, pictographs, bar graphs, and line graphs, and use a title, appropriate scale, and labels. A grid will be provided to display data on bar graphs or line graphs.	M05.D-M.2.1.2	M05.D-M.2.1.2
Math	Grade 5	Grade 5 Math	Place Value	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Applies strategies to solve multi-step grade level real word problems and clearly communicates mathematical thinking.	CYM05.A-T.2.1.4	N/A
Math	Grade 5	Grade 5 Math	Addition & Subtraction	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Applies strategies to solve multi-step grade level real word problems and clearly communicates mathematical thinking.	CYM05.A-T.2.1.4	N/A
Math	Grade 5	Grade 5 Math	Multiplication	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Applies strategies to solve multi-step grade level real word problems and clearly communicates mathematical thinking.	CYM05.A-T.2.1.4	N/A
Math	Grade 5	Grade 5 Math	Division	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Applies strategies to solve multi-step grade level real word problems and clearly communicates mathematical thinking.	CYM05.A-T.2.1.4	N/A
Math	Grade 5	Grade 5 Math	Fractions (Adding & Subtracting)	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Applies strategies to solve multi-step grade level real word problems and clearly communicates mathematical thinking.	CYM05.A-T.2.1.4	N/A
Math	Grade 5	Grade 5 Math	Fractions (Multiplying & Dividing)	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Applies strategies to solve multi-step grade level real word problems and clearly communicates mathematical thinking.	CYM05.A-T.2.1.4	N/A
Math	Grade 5	Grade 5 Math	Geometry	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Applies strategies to solve multi-step grade level real word problems and clearly communicates mathematical thinking.	CYM05.A-T.2.1.4	N/A

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 5	Grade 5 Math	Algebra	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Applies strategies to solve multi-step grade level real word problems and clearly communicates mathematical thinking.	CYM05.A-T.2.1.4	N/A
Math	Grade 5	Grade 5 Math	Fractions (Scaling & Line Plots)	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Applies strategies to solve multi-step grade level real word problems and clearly communicates mathematical thinking.	CYM05.A-T.2.1.4	N/A
Math	Grade 5	Grade 5 Math	Measurement & Data	Applies strategies to solve grade level real world problems and clearly communicates mathematical thinking	Applies strategies to solve multi-step grade level real word problems and clearly communicates mathematical thinking.	CYM05.A-T.2.1.4	N/A
Math	Grade 6	Grade 6 Math	Expressions & Equations	Use substitution to determine if a number makes an inequality or equation true	Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	M06.B-E.2.1.1	M06.B-E.2.1.1
Math	Grade 6	Grade 6 Math	Expressions & Equations	Write and solve equations that represent real-world problems	Write algebraic expressions to represent real-world or mathematical problems.	M06.B-E.2.1.2	M06.B-E.2.1.2
Math	Grade 6	Grade 6 Math	Expressions & Equations	Write and solve equations that represent real-world problems	Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q, and x are all non-negative rational numbers.	M06.B-E.2.1.3	M06.B-E.2.1.3
Math	Grade 6	Grade 6 Math	Expressions & Equations	Create and solve inequalities in a real-world problem	Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem and/or represent solutions of such inequalities on number lines.	M06.B-E.2.1.4	M06.B-E.2.1.4
Math	Grade 6	Grade 6 Math	Expressions & Equations	Evaluate expressions involving exponents.	Write and evaluate numerical expressions involving whole-number exponents.	M06.B-E.1.1.1	M06.B-E.1.1.1
Math	Grade 6	Grade 6 Math	Expressions & Equations	Apply properties of operations to create equivalent expressions.	Apply the properties of operations to generate equivalent expressions.	M06.B-E.1.1.5	M06.B-E.1.1.5
Math	Grade 6	Grade 6 Math	Expressions & Equations	Write algebraic expressions from descriptions or to represent real world problems and identify parts of those expressions	Write algebraic expressions from verbal descriptions.	M06.B-E.1.1.2	M06.B-E.1.1.2
Math	Grade 6	Grade 6 Math	Expressions & Equations	Write algebraic expressions from descriptions or to represent real world problems and identify parts of those expressions	Identify parts of an expression using mathematical terms (e.g., sum, term, product, factor, quotient,coefficient, quantity).	M06.B-E.1.1.3	M06.B-E.1.1.3
Math	Grade 6	Grade 6 Math	Expressions & Equations	Write algebraic expressions from descriptions or to represent real world problems and identify parts of those expressions	Evaluate expressions at specific values of their variables, including expressions that arise from formulas used in real-world problems.	M06.B-E.1.1.4	M06.B-E.1.1.4
Math	Grade 6	Grade 6 Math	Expressions & Equations	Create, use and analyze equations that demonstrate the relationship between dependent and independent variables	Write an equation to express the relationship between the dependent and independent variables.	M06.B-E.3.1.1	M06.B-E.3.1.1
Math	Grade 6	Grade 6 Math	Expressions & Equations	Create, use and analyze equations that demonstrate the relationship between dependent and independent variables	Analyze the relationship between the dependent and independent variables using graphs and tables and/or relate these to an equation.	M06.B-E.3.1.2	M06.B-E.3.1.2
Math	Grade 6	Grade 6 Math	Geometry	Determine area of triangles, quadrilaterals and irregular polygons.	Determine the area of triangles and special quadrilaterals (i.e., square, rectangle, parallelogram, rhombus, and trapezoid). Formulas will be provided.	M06.C-G.1.1.1	M06.C-G.1.1.1
Math	Grade 6	Grade 6 Math	Geometry	Determine area of triangles, quadrilaterals and irregular polygons.	Determine the area of irregular or compound polygons.	M06.C-G.1.1.2	M06.C-G.1.1.2
Math	Grade 6	Grade 6 Math	Geometry	Determine volume of rectangular prisms.	Determine the volume of right rectangular prisms with fractional edge lengths. Formulas will be provided.	M06.C-G.1.1.3	M06.C-G.1.1.3
Math	Grade 6	Grade 6 Math	Geometry	Plot ordered pairs on a four quadrant plane to represent real-world problems, including the distance between points and side lengths/area of polygons.	Given coordinates for the vertices of a polygon in the plane, use the coordinates to find side lengths and area of the polygon (limited to triangles and special quadrilaterals). Formulas provided.	M06.C-G.1.1.4	M06.C-G.1.1.4
Math	Grade 6	Grade 6 Math	Geometry	Represent 3D figures using nets and determine the surface area of triangular and rectangular prisms (with and without nets)	Represent three-dimensional figures using nets made up of rectangles and triangles.	M06.C-G.1.1.5	M06.C-G.1.1.5
Math	Grade 6	Grade 6 Math	Geometry	Represent 3D figures using nets and determine the surface area of triangular and rectangular prisms (with and without nets)	Determine the surface area of triangular and rectangular prisms (including cubes). Formulas provided.	M06.C-G.1.1.6	M06.C-G.1.1.6

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 6	Grade 6 Math	Number Systems	Compute accurately with fractions and mixed numbers	Interpret and compute quotients of fractions (including mixed numbers), and solve word problems involving division of fractions by fractions.	M06.A-N.1.1.1	M06.A-N.1.1.1
Math	Grade 6	Grade 6 Math	Number Systems	Compute accurately with whole numbers and decimals	Solve problems involving operations (+, -, x, ÷) with whole numbers, decimals (through thousandths), straight computation, or word problems.	M06.A-N.2.1.1	M06.A-N.2.1.1
Math	Grade 6	Grade 6 Math	Number Systems	Find the least common multiple and greatest common factor of two whole numbers	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12.	M06.A-N.2.2.1	M06.A-N.2.2.1
Math	Grade 6	Grade 6 Math	Number Systems	Apply the distributive property to factor two whole numbers	Apply the distributive property to express a sum of whole numbers, 1 through 100, with a common factor as a multiple of a sum of two whole numbers with no common factor.	M06.A-N.2.2.2	M06.A-N.2.2.2
Math	Grade 6	Grade 6 Math	Number Systems	Represent quantities in real-world contexts using positive and negative numbers	Represent quantities in real-world contexts using positive and negative numbers, explaining the meaning of 0 in each situation (e.g., temperature above/below zero, elevation above/below sea level, credits/debts, positive/negative electric charge).	M06.A-N.3.1.1	M06.A-N.3.1.1
Math	Grade 6	Grade 6 Math	Number Systems	Represent quantities in real-world contexts using positive and negative numbers	Determine the opposite of a number and recognize that the opposite of the opposite of a number is the number itself (e.g., -(-3) = 3, and that 0 is its own opposite.	M06.A-N.3.1.2	M06.A-N.3.1.2
Math	Grade 6	Grade 6 Math	Number Systems	Plot intergers on a number line, and identify the absolute value and opposite of that number, while applying to real world context	Locate and plot integers and other rational numbers on a horizontal or vertical number line; locate and plot pairs of integers and other rational numbers on a coordinate plane.	M06.A-N.3.1.3	M06.A-N.3.1.3
Math	Grade 6	Grade 6 Math	Number Systems	Explain statements of order for rational numbers	Write, interpret, and explain statements of order for rational numbers in real world contexts.	M06.A-N.3.2.1	M06.A-N.3.2.1
Math	Grade 6	Grade 6 Math	Number Systems	Interpret absolute value, and apply it to real world situations and solving of expressions and equations	Interpret the absolute value of a rational number as its distance from 0 on the number line and as a magnitude for a positive or negative quantity in a real-world situation.	M06.A-N.3.2.2	M06.A-N.3.2.2
Math	Grade 6	Grade 6 Math	Number Systems	Solve real-world and mathematical problems by plotting points in all four quadrants of the coordinate plane.	Solve real-world and mathematical problems by plotting points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	M06.A-N.3.2.3	M06.A-N.3.2.3
Math	Grade 6	Grade 6 Math	Statistics & Probability	Display numerical data on dot plots, histograms, and box-and-whisker plots	Display numerical data in plots on a number line, including dot plots, histograms, and box-and-whisker plots.	M06.D-S.1.1.1	M06.D-S.1.1.1
Math	Grade 6	Grade 6 Math	Statistics & Probability	Determine quantative measures of center (mean, median, mode) and variability (range, interquartile range, mean absoulte deviation)	Determine quantitative measures of center (e.g.,median, mean, and/or mode) and variability (e.g., range, interquartile range, and/or mean absolute deviation).	M06.D-S.1.1.2	M06.D-S.1.1.2
Math	Grade 6	Grade 6 Math	Statistics & Probability	Describe patterns and deviations from patterns	Describe any overall pattern and any deviations from the overall pattern with reference to the context in which the data were gathered.	M06.D-S.1.1.3	M06.D-S.1.1.3
Math	Grade 6	Grade 6 Math	Statistics & Probability	Relate the choice of measure, variability, and patterns observed to the context in which the data were gathered	Relate the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	M06.D-S.1.1.4	M06.D-S.1.1.4
Math	Grade 6	Grade 6 Math	Ratios and Proportional Relationships	Use ratio notation and construct and use ratios to complete tables and determine missing values	Use ratio language and notation (such as 3 to 4, 3:4, 3/4) to describe a ratio relationship between two quantities.	M06.A-R.1.1.1	M06.A-R.1.1.1
Math	Grade 6	Grade 6 Math	Ratios and Proportional Relationships	Find the unit rate of an associated ratio	Find the unit rate a/b associated with a ratio a:b (with b ≠ 0), and use rate language in the context of a ratio relationship.	M06.A-R.1.1.2	M06.A-R.1.1.2
Math	Grade 6	Grade 6 Math	Ratios and Proportional Relationships	Construct tables of equivalent ratios for comparison	Construct tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and/or plot the pairs of values on the coordinate plane. Use tables to compare ratios.	M06.A-R.1.1.3	M06.A-R.1.1.3
Math	Grade 6	Grade 6 Math	Ratios and Proportional Relationships	Accurately calculate unit rate problems, including speed and pricing using self-generated equations	Solve unit rate problems including those involving unit pricing and constant speed.	M06.A-R.1.1.4	M06.A-R.1.1.4
Math	Grade 6	Grade 6 Math	Ratios and Proportional Relationships	Find a percent of a quantity (number)	Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.	M06.A-R.1.1.5	M06.A-R.1.1.5
Math	Grade 7	Grade 7 Math	Expressions & Equations	Represent expressions in equivalent forms.	Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients.	M07.B-E.1.1.1	
Math	Grade 7	Grade 7 Math	Expressions & Equations	Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities.	Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate.	M07.B-E.2.1.1	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 7	Grade 7 Math	Expressions & Equations	Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities.	Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers.	M07.B-E.2.2.1	
Math	Grade 7	Grade 7 Math	Expressions & Equations	Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities.	Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers, and graph the solution set of the inequality.	M07.B-E.2.2.2	
Math	Grade 7	Grade 7 Math	Expressions & Equations	Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities.	Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem.	M07.B-E.2.3.1	
Math	Grade 7	Grade 7 Math	Geometry	Demonstrate an understanding of geometric figures and their properties.	Solve problems involving scale drawings of geometric figures, including finding length and area.	M07.C-G.1.1.1	
Math	Grade 7	Grade 7 Math	Geometry	Demonstrate an understanding of geometric figures and their properties.	Identify or describe the properties of all types of triangles based on angle and side measures.	M07.C-G.1.1.2	
Math	Grade 7	Grade 7 Math	Geometry	Demonstrate an understanding of geometric figures and their properties.	Use and apply the triangle inequality theorem.	M07.C-G.1.1.3	
Math	Grade 7	Grade 7 Math	Geometry	Demonstrate an understanding of geometric figures and their properties.	Describe the two-dimensional figures that result from slicing three-dimensional figures.	M07.C-G.1.1.4	
Math	Grade 7	Grade 7 Math	Geometry	Solve real-world and mathematical problems involving angle measure, circumference, area, surface area, and volume.	Identify and use properties of supplementary, complementary, and adjacent angles in a multi- step problem to write and solve simple equations for an unknown angle in a figure.	M07.C-G.2.1.1	
Math	Grade 7	Grade 7 Math	Geometry	Solve real-world and mathematical problems involving angle measure, circumference, area, surface area, and volume.	Identify and use properties of angles formed when two parallel lines are cut by a transversal (e.g., angles may include alternate interior, alternate exterior, vertical, corresponding).	M07.C-G.2.1.2	
Math	Grade 7	Grade 7 Math	Geometry	Solve real-world and mathematical problems involving angle measure, circumference, area, surface area, and volume.	Find the area and circumference of a circle. Solve problems involving area and circumference of a circle(s). Formulas will be provided.	M07.C-G.2.2.1	
Math	Grade 7	Grade 7 Math	Geometry	Solve real-world and mathematical problems involving angle measure, circumference, area, surface area, and volume.	Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. Formulas will be provided.	M07.C-G.2.2.2	
Math	Grade 7	Grade 7 Math	Number Systems	Apply and extend previous understandings of operations to add, subtract, multiply, and divide rational numbers.	Apply properties of operations to add and subtract rational numbers, including real-world contexts.	M07.A-N.1.1.1	
Math	Grade 7	Grade 7 Math	Number Systems	Apply and extend previous understandings of operations to add, subtract, multiply, and divide rational numbers.	Represent addition and subtraction on a horizontal or vertical number line.	M07.A-N.1.1.2	
Math	Grade 7	Grade 7 Math	Number Systems	Apply and extend previous understandings of operations to add, subtract, multiply, and divide rational numbers.	Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeats.	M07.A-N.1.1.3	
Math	Grade 7	Grade 7 Math	Statistics & Probability	Use random sampling to draw inferences about a population.	Determine whether a sample is a random sample given a real-world situation.	M07.D-S.1.1.1	
Math	Grade 7	Grade 7 Math	Statistics & Probability	Use random sampling to draw inferences about a population.	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest.	M07.D-S.1.1.2	
Math	Grade 7	Grade 7 Math	Statistics & Probability	Draw comparative inferences about populations.	Compare two numerical data distributions using measures of center and variability.	M07.D-S.2.1.1	
Math	Grade 7	Grade 7 Math	Statistics & Probability	Investigate chance processes and develop, use, and evaluate probability models.	Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (i.e., a probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event).	M07.D-S.3.1.1	
Math	Grade 7	Grade 7 Math	Statistics & Probability	Investigate chance processes and develop, use, and evaluate probability models.	Determine the probability of a chance event given relative frequency. Predict the approximate relative frequency given the probability.	M07.D-S.3.2.1	
Math	Grade 7	Grade 7 Math	Statistics & Probability	Investigate chance processes and develop, use, and evaluate probability models.	Find the probability of a simple event, including the probability of a simple event not occurring.	M07.D-S.3.2.2	
Math	Grade 7	Grade 7 Math	Statistics & Probability	Investigate chance processes and develop, use, and evaluate probability models.	Find probabilities of independent compound events using organized lists, tables, tree diagrams, and simulation.	M07.D-S.3.2.3	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 7	Grade 7 Math	Ratios and Proportional Relationships	Demonstrate an understanding of proportional relationships.	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.	M07.A-R.1.1.1	
Math	Grade 7	Grade 7 Math	Ratios and Proportional Relationships	Demonstrate an understanding of proportional relationships.	Determine whether two quantities are proportionally related (e.g., by testing for equivalent ratios in a table, graphing on a coordinate plane and observing whether the graph is a straight line through the origin).	M07.A-R.1.1.2	
Math	Grade 7	Grade 7 Math	Ratios and Proportional Relationships	Demonstrate an understanding of proportional relationships.	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	M07.A-R.1.1.3	
Math	Grade 7	Grade 7 Math	Ratios and Proportional Relationships	Demonstrate an understanding of proportional relationships.	Represent proportional relationships by equations.	M07.A-R.1.1.4	
Math	Grade 7	Grade 7 Math	Ratios and Proportional Relationships	Demonstrate an understanding of proportional relationships.	Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r), where r is the unit rate.	M07.A-R.1.1.5	
Math	Grade 7	Grade 7 Math	Ratios and Proportional Relationships	Demonstrate an understanding of proportional relationships.	Use proportional relationships to solve multi-step ratio and percent problems.	M07.A-R.1.1.6	
Math	Grade 8	Grade 8 Math	The Number System	Demonstrate an understanding of rational and irrational numbers	Determine whether a number is rational or irrational. For rational numbers, show that the decimal expansion terminates or repeats (limit repeating decimals to thousandths).	M08.A-N.1.1.1	
Math	Grade 8	Grade 8 Math	The Number System	Demonstrate an understanding of rational and irrational numbers	Convert a terminating or repeating decimal to a rational number (limit repeating decimals to thousandths).	M08.A-N.1.1.2	
Math	Grade 8	Grade 8 Math	The Number System	Demonstrate an understanding of rational and irrational numbers	Estimate the value of irrational numbers without a calculator (limit whole number radicand to less than 144).	M08.A-N.1.1.3	
Math	Grade 8	Grade 8 Math	The Number System	Demonstrate an understanding of rational and irrational numbers	Use rational approximations of irrational numbers to compare and order irrational numbers.	M08.A-N.1.1.4	
Math	Grade 8	Grade 8 Math	The Number System	Demonstrate an understanding of rational and irrational numbers	Locate/identify rational and irrational numbers at their approximate locations on a number line.	M08.A-N.1.1.5	
Math	Grade 8	Grade 8 Math	Expressions & Equations	Demonstrate an understanding of expressions and equations with radicals and integer exponents.	Apply one or more properties of integer exponents to generate equivalent numerical expressions without a calculator (with final answers expressed in exponential form with positive exponents). Properties will be provided.	M08.B-E.1.1.1	
Math	Grade 8	Grade 8 Math	Expressions & Equations	Demonstrate an understanding of expressions and equations with radicals and integer exponents.	Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of perfect squares (up to and including 122) and cube roots of perfect cubes (up to and including 53) without a calculator.	M08.B-E.1.1.2	
Math	Grade 8	Grade 8 Math	Expressions & Equations	Demonstrate an understanding of expressions and equations with radicals and integer exponents.	Estimate very large or very small quantities by using numbers expressed in the form of a single digit times an integer power of 10 and express how many times larger or smaller one number is than another.	M08.B-E.1.1.3	
Math	Grade 8	Grade 8 Math	Expressions & Equations	Demonstrate an understanding of expressions and equations with radicals and integer exponents.	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Express answers in scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology (e.g., interpret 4.7EE9 displayed on a calculator as 4.7 × 109).	M08.B-E.1.1.4	
Math	Grade 8	Grade 8 Math	Expressions & Equations	Understand the connections between proportional relationships, lines, and linear equations.	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	M08.B-E.2.1.1	
Math	Grade 8	Grade 8 Math	Expressions & Equations	Understand the connections between proportional relationships, lines, and linear equations.	Use similar right triangles to show and explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane.	M08.B-E.2.1.2	
Math	Grade 8	Grade 8 Math	Expressions & Equations	Understand the connections between proportional relationships, lines, and linear equations.	Derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.	M08.B-E.2.1.3	
Math	Grade 8	Grade 8 Math	Expressions & Equations	Analyze and solve linear equations and pairs of simultaneous linear equations.	Write and identify linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).	M08.B-E.3.1.1	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	Grade 8	Grade 8 Math	Expressions & Equations	Analyze and solve linear equations and pairs of simultaneous linear equations.	Solve linear equations that have rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	M08.B-E.3.1.2	
Math	Grade 8	Grade 8 Math	Expressions & Equations	Analyze and solve linear equations and pairs of simultaneous linear equations.	Interpret solutions to a system of two linear equations in two variables as points of intersection of their graphs because points of intersection satisfy both equations simultaneously.	M08.B-E.3.1.3	
Math	Grade 8	Grade 8 Math	Expressions & Equations	Analyze and solve linear equations and pairs of simultaneous linear equations.	Solve systems of two linear equations in two variables algebraically and estimate solutions by graphing the equations. Solve simple cases by inspection.	M08.B-E.3.1.4	
Math	Grade 8	Grade 8 Math	Expressions & Equations	Analyze and solve linear equations and pairs of simultaneous linear equations.	Solve real-world and mathematical problems leading to two linear equations in two variables.	M08.B-E.3.1.5	
Math	Grade 8	Grade 8 Math	Functions	Analyze and interpret functions.	Determine whether a relation is a function.	M08.B-F.1.1.1	
Math	Grade 8	Grade 8 Math	Functions	Analyze and interpret functions.	Compare properties of two functions, each represented in a different way (i.e., algebraically, graphically, numerically in tables, or by verbal descriptions).	M08.B-F.1.1.2	
Math	Grade 8	Grade 8 Math	Functions	Analyze and interpret functions.	Interpret the equation y = mx + b as defining a linear function whose graph is a straight line; give examples of functions that are not linear.	M08.B-F.1.1.3	
Math	Grade 8	Grade 8 Math	Functions	Use functions to model relationships between quantities.	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models and in terms of its graph or a table of values.	M08.B-F.2.1.1	
Math	Grade 8	Grade 8 Math	Functions	Use functions to model relationships between quantities.	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch or determine a graph that exhibits the qualitative features of a function that has been described verbally.	M08.B-F.2.1.2	
Math	Grade 8	Grade 8 Math	Geometry	Demonstrate an understanding of geometric transformations.	Identify and apply properties of rotations, reflections, and translations. Example: Angle measures are preserved in rotations, reflections, and translations.	M08.C-G.1.1.1	
Math	Grade 8	Grade 8 Math	Geometry	Demonstrate an understanding of geometric transformations.	Given two congruent figures, describe a sequence of transformations that exhibits the congruence between them.	M08.C-G.1.1.2	
Math	Grade 8	Grade 8 Math	Geometry	Demonstrate an understanding of geometric transformations.	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	M08.C-G.1.1.3	
Math	Grade 8	Grade 8 Math	Geometry	Demonstrate an understanding of geometric transformations.	Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.	M08.C-G.1.1.4	
Math	Grade 8	Grade 8 Math	Geometry	Understand and apply the Pythagorean theorem.	Apply the converse of the Pythagorean theorem to show a triangle is a right triangle.	M08.C-G.2.1.1	
Math	Grade 8	Grade 8 Math	Geometry	Understand and apply the Pythagorean theorem.	Apply the Pythagorean theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. (Figures provided for problems in three dimensions will be consistent with Eligible Content in grade 8 and below.)	M08.C-G.2.1.2	
Math	Grade 8	Grade 8 Math	Geometry	Understand and apply the Pythagorean theorem.	Apply the Pythagorean theorem to find the distance between two points in a coordinate system.	M08.C-G.2.1.3	
Math	Grade 8	Grade 8 Math	Geometry	Solve real-world and mathematical problems involving volume.	Apply formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems. Formulas will be provided.	M08.C-G.3.1.1	
Math	Grade 8	Grade 8 Math	Statistics and Probability	Investigate patterns of association in bivariate data.	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative correlation, linear association, and nonlinear association.	M08.D-S.1.1.1	
Math	Grade 8	Grade 8 Math	Statistics and Probability	Investigate patterns of association in bivariate data.	For scatter plots that suggest a linear association, identify a line of best fit by judging the closeness of the data points to the line.	M08.D-S.1.1.2	
Math	Grade 8	Grade 8 Math	Statistics and Probability	Investigate patterns of association in bivariate data.	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.	M08.D-S.1.1.3	
Math	Grade 8	Grade 8 Math	Statistics and Probability	Investigate patterns of association in bivariate data.	Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible associations between the two variables.	M08.D-S.1.2.1	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Algebra I	Algebraic Concepts	Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, and exponents).	Compare and/ or order any real numbers. Note: Rational and irrational may be mixed	A1.1.1.1.1	
Math	HS	Algebra I	Algebraic Concepts	Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, and exponents).	Simplify Square roots	A1.1.1.1.2	
Math	HS	Algebra I	Quadratic & Rational Functions	Apply number theory concepts to show relationships between real numbers in problemsolving settings.	Find the Greatest Common Factor (GCF) and.or Least Common Multiple for sets of monomials	A1.1.1.2.1	
Math	HS	Algebra I	Algebraic Concepts	Use exponents, roots, and/or absolute values to solve problems.	Simplify/ evaluate expressions involving properties/ laws of exponents, roots, and/or absolute values to solve problems.	A1.1.1.3.1	
Math	HS	Algebra I	Algebraic Concepts	Use estimation strategies in problem-solving situations.	Use estimation strategies in problem-solving situations.	A1.1.1.4.1	
Math	HS	Algebra I	Algebraic Concepts	Simplify expressions involving polynomials.	Add, subtract, and/or multiply polynomials expressions (express answers in simplest form)	A1.1.1.5.1	
Math	HS	Algebra I	Quadratic & Rational Functions	Simplify expressions involving polynomials.	Factor algebraic expressions, including difference of squares and trinomials. (a=1, after taking out GCF)	A1.1.1.5.2	
Math	HS	Algebra I	Quadratic & Rational Functions	Simplify expressions involving polynomials.	Simplify/ reduce a rational algebraic expression.	A1.1.1.5.3	
Math	HS	Algebra I	Algebraic Concepts	Write, solve, and/or graph linear equations using various methods.	Write, solve, and/or apply a linear equation (including problem situation).	A1.1.2.1.1	
Math	HS	Algebra I	Linear Functions	Write, solve, and/or graph linear equations using various methods.	Use and/or identify an algebraic property to justify any step in an equation- solving process.	A1.1.2.1.2	
Math	HS	Algebra I	Graphing & Systems of Equations	Write, solve, and/or graph linear equations using various methods.	Use and/or identify an algebraic property to justify any step in an equation- solving process.	A1.1.2.1.2	
Math	HS	Algebra I	Algebraic Concepts	Write, solve, and/or graph linear equations using various methods.	Use and/or identify an algebraic property to justify any step in an equation- solving process.	A1.1.2.1.2	
Math	HS	Algebra I	Linear Functions	Write, solve, and/or graph linear equations using various methods.	Interpret solutions to problems in the context of the problem situation. (linear equations only)	A1.1.2.1.3	
Math	HS	Algebra I	Graphing & Systems of Equations	Write, solve, and/or graph linear equations using various methods.	Interpret solutions to problems in the context of the problem situation. (linear equations only)	A1.1.2.1.3	
Math	HS	Algebra I	Algebraic Concepts	Write, solve, and/or graph linear equations using various methods.	Interpret solutions to problems in the context of the problem situation. (linear equations only)	A1.1.2.1.3	
Math	HS	Algebra I	Linear Functions	Write, solve, and/or graph systems of linear equations using various methods.	Write and/or solve a system of linear equations (including problem situation) using graphing, substitution, and/or elimination.	A1.1.2.2.1	
Math	HS	Algebra I	Graphing & Systems of Equations	Write, solve, and/or graph systems of linear equations using various methods.	Write and/or solve a system of linear equations (including problem situation) using graphing, substitution, and/or elimination.	A1.1.2.2.1	
Math	HS	Algebra I	Graphing & Systems of Equations	Write, solve, and/or graph systems of linear equations using various methods.	Write and/or solve a system of linear equations (including problem situation) using graphing, substitution, and/or elimination.	A1.1.2.2.1	
Math	HS	Algebra I	Graphing & Systems of Equations	Write, solve, and/or graph systems of linear equations using various methods.	Interpret solutions to problems in the context of the problem situation (systems of 2 linear equations only)	A1.1.2.2.2	
Math	HS	Algebra I	Algebraic Concepts	Write, solve, and/or graph linear inequalities using various methods.	Write or solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities)	A1.1.3.1.1	
Math	HS	Algebra I	Algebraic Concepts	Write, solve, and/or graph linear inequalities using various methods.	Identify or graph the solution set to a linear inequality on a number line.	A1.1.3.1.2	
Math	HS	Algebra I	Algebraic Concepts	Write, solve, and/or graph linear inequalities using various methods.	Interpret solutions to problems in the context of the problem situation (linear inequalities only)	A1.1.3.1.3	
Math	HS	Algebra I	Graphing & Systems of Equations	Write, solve, and/or graph systems of linear inequalities using various methods.	Write and/or solve a system of linear inequalities using graphing.	A1.1.3.2.1	
Math	HS	Algebra I	Graphing & Systems of Equations	Write, solve, and/or graph systems of linear inequalities using various methods.	Interpret solutions to problems in the context of the problem situation (systems of 2 linear inequalities only)	A1.1.3.2.2	
					Use estimation to solve problems	A1.1.1.4.1	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Algebra I	Linear Functions	Analyze and/or use patterns or relations.	Analyze a set if data for the existence of a pattern and represent the pattern algebraically or graphically.	A1.2.1.1.1	
Math	HS	Algebra I	Linear Functions	Analyze and/or use patterns or relations.	Determine whether a relation is a function, give a set of points or a graph	A1.2.1.1.2	
Math	HS	Algebra I	Linear Functions	Analyze and/or use patterns or relations.	Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table).	A1.2.1.1.3	
Math	HS	Algebra I	Linear Functions	Interpret and/or use linear functions and their equations, graphs, or tables.	Create, interpret, and/or use the equation, graph, or table of a linear function.	A1.2.1.2.1	
Math	HS	Algebra I	Graphing & Systems of Equations	Interpret and/or use linear functions and their equations, graphs, or tables.	Translate from one representation of a linear function to another (i.e. graph, table, and equation).	A1.2.1.2.2	
Math	HS	Algebra I	Linear Functions	Interpret and/or use linear functions and their equations, graphs, or tables.	Translate from one representation of a linear function to another (i.e. graph, table, and equation).	A1.2.1.2.2	
Math	HS	Algebra I	Graphing & Systems of Equations	Describe, compute, and/or use the rate of change (slope) of a line.	Identify, describe, and/or use constant rate of change.	A1.2.2.1.1	
Math	HS	Algebra I	Linear Functions	Describe, compute, and/or use the rate of change (slope) of a line.	Identify, describe, and/or use constant rate of change.	A1.2.2.1.1	
Math	HS	Algebra I	Linear Functions	Describe, compute, and/or use the rate of change (slope) of a line.	Apply the concept of linear rate of change (slope) to solve problems.	A1.2.2.1.2	
Math	HS	Algebra I	Linear Functions	Describe, compute, and/or use the rate of change (slope) of a line.	Write or identify a linear equation when given the graph of a line, two points on the line, or the slope and a paint on the line (may be in standard, slope-intercept, or point-slope form)	A1.2.2.1.3	
Math	HS	Algebra I	Linear Functions	Describe, compute, and/or use the rate of change (slope) of a line.	Determine the slope and/or y-intercept represented by a linear equation or graph	A1.2.2.1.4	
Math	HS	Algebra I	Graphing & Systems of Equations	Analyze and/or interpret data on a scatter plot.	Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.	A1.2.2.2.1	
Math	HS	Algebra I	Probability & Statistics	Use measures of dispersion to describe a set of data.	Calculate and/or interpret the range, quartiles, and interquartiles range of data.	A1.2.3.1.1	
Math	HS	Algebra I	Probability & Statistics	Use data displays in problemsolving settings and/or to make predictions.	Estimate or calculate to make predictions based on a circle, line, bar graph, measure of central tendency, or other representation.	A1.2.3.2.1	
Math	HS	Algebra I	Probability & Statistics	Use data displays in problemsolving settings and/or to make predictions.	Analyze data, make predictions, and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots, scatter plots, measures of central tendency, or other representation).	A1.2.3.2.2	
Math	HS	Algebra I	Probability & Statistics	Apply probability to practical situations.	Find Probabilities for compound events (e.g. find probability of red and bleu, find probability of red or blue) and represent as a fraction, decimal, or percent.	A1.2.3.3.1	
Math	HS	AP Calculus	Algebraic Concepts	Analyze change in various contexts.	Analyze particle motion along a line, including position, displacement, and total distance.	EK 2.3C1	EK 2.3C1
Math	HS	AP Calculus	Algebraic Concepts	Analyze change in various contexts.	Analyze the relationship between slope fields and solution curves for differential equations.	EK 2.3F1a	EK 2.3F1
Math	HS	AP Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Apply the geometric series to determine convergence, divergence, and error bound.	EK 4.1B1	EK 4.1B1
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Apply the Mean Value Theorem for definite integrals to find the average value of a function.	EK 3.4B1	EK 2.4A1
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Apply the properties of definite integrals, including order of integration, zero, constant mulitple, sum, and additivity.	EK 3.2C2	EK 3.2C2
Math	HS	AP Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Approximate definite integrals for functions represented by graphs and by tables of values.	EK 3.2B1	EK 3.2B1
Math	HS	AP Calculus	Algebraic Concepts	Analyze change in various contexts.	Compute the Lagrange error bound for Taylor polynomials.	EK 4.2A5b	EK 4.2A5
Math	HS	AP Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Define a series as a sequence of partial sums.	EK 4.2B5a	EK 4.2B5

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	AP Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Define convergence of a series as the limit of the sequence of partial sums.	EK 4.1A6b	EK 4.1A6
Math	HS	AP Calculus	Algebraic Concepts	Analyze change in various contexts.	Determine conditional convergence and error bound for alternating series.	EK 4.2A5a	EK 4.2A5
Math	HS	AP Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Determine Maclaurin series and the general Taylor series centered at x=a.	EK 4.2A2b	EK 4.2A2
Math	HS	AP Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Determine Maclaurin series for the functions e^x, sin x, cos x, and 1/(1-x).	EK 4.2B2	EK 4.2B2
Math	HS	AP Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Determine the radius and interval of convergence of power series.	EK 4.2C2a	EK 4.2C2
Math	HS	AP Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Determine velocity and acceleration vectors.	EK 3.4C2b	EK 3.4C2
Math	HS	AP Calculus	Algebraic Concepts	Analyze change in various contexts.	Distinguish between absolute and conditional convergence.	EK 4.1A4	EK 4.1A4
Math	HS	AP Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Evaluate improper integrals as limits of definite integrals.	EK 3.2D2	EK 3.2D2
Math	HS	AP Calculus	Numbers and Operations	Compute accurately and fluently and make reasonable estimates.	Find derivatives of parametric functions.	EK 2.3C4a	EK 2.3C4
Math	HS	AP Calculus	Numbers and Operations	Compute accurately and fluently and make reasonable estimates.	Find derivatives of polar functions.	EK 2.3C4b	EK 2.3C4
Math	HS	AP Calculus	Numbers and Operations	Compute accurately and fluently and make reasonable estimates.	Find derivatives of vector functions.	EK 2.3C4c	EK 2.3C4
Math	HS	AP Calculus	Algebraic Concepts	Analyze change in various contexts.	Find position and acceleration from velocity or position and velocity from acceleration.	EK 3.1A1	EK 3.1A1
Math	HS	AP Calculus	Algebraic Concepts	Analyze change in various contexts.	Find specific antiderivatives using initial conditions.	EK 3.3B1	EK 3.3B1
Math	HS	AP Calculus	Algebraic Concepts	Analyze change in various contexts.	Find the area between curves.	EK 3.4D1a	EK 3.4D1
Math	HS	AP Calculus	Numbers and Operations	Compute accurately and fluently and make reasonable estimates.	Find the area of a region bounded by polar curves.	EK 3.4D1b	EK 3.4D1
Math	HS	AP Calculus	Numbers and Operations	Compute accurately and fluently and make reasonable estimates.	Find the length of a curve given in parametric form.	EK 3.4D3b	EK 3.4D3
Math	HS	AP Calculus	Numbers and Operations	Compute accurately and fluently and make reasonable estimates.	Find the length of a curve.	EK 3.4D3a	EK 3.4D3
Math	HS	AP Calculus	Algebraic Concepts	Analyze change in various contexts.	Find the volume of a solid of revolution by the disk, washer, or cylindrical shell method.	EK 3.4D2b	EK 3.4D2
Math	HS	AP Calculus	Algebraic Concepts	Analyze change in various contexts.	Find the volume of a solid region with known cross-sectional area.	EK 3.4D2a	EK 3.4D2
Math	HS	AP Calculus	Algebraic Concepts	Analyze change in various contexts.	Find work done when a variable force is applied to an object.	EK 3.4E1	EK 3.4E1
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Perform analytic and graphical analysis of particular antiderivatives represented using the Fundamental Theorem of Calculus.	EK 3.3A3	EK 3.3A3
Math	HS	AP Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Represent terms of series as areas of rectangles and relate those areas to improper integrals.	EK 4.2B5b	EK 4.2B5
Math	HS	AP Calculus	Algebraic Concepts	Analyze change in various contexts.	Solve logistic differential equations.	EK 3.5B2a	EK 3.5B2
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Solve separable differential equations [f(y)dy=f(x)dx].	EK 3.5A2a	EK 3.5A2
Math	HS	AP Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use Euler's method to find numerical solutions to differnetial equations.	EK 2.3F2	EK 2.3F2
Math	HS	AP Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Use graphs to demonstrate the convergence of Taylor polynomial approximations.	EK 4.2A2a	EK 4.2A2
Math	HS	AP Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use integration by parts to find antiderivatives.	EK 3.3B5b	EK 3.3B5
Math	HS	AP Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use L'Hopital's rule to determine convergence of improper integrals.	EK 3.2D1	EK 3.2D1
Math	HS	AP Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use L'Hopital's rule to determine convergence of series.	EK 4.1A6a	EK 4.1A6

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	AP Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use L'Hopital's rule to find limits of indeterminate forms.	EK 1.1	EK 1.1C3
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use logistic differential equations in modeling.	EK 3.5B2b	EK 3.5B2
Math	HS	AP Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use partial fractions with non-repeating linear factors to find antiderivatives.	EK 3.3B5a	EK 3.3B5
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use power series to represent functions.	EK 4.2B1	EK 4.2B1
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use separable differential equations in modeling.	EK 3.5A2b	EK 3.5A2
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use slope fields to interpret differential equations geometrically.	EK 2.3F1b	EK 2.3F1
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use substitution, differentiation, and integration to form new series from known series.	EK 4.2B5c	EK 4.2B5
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use the comparison test to determine convergence and divergence.	EK 4.2C3a	EK 4.2C3
Math	HS	AP Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use the first and second derivative to analyze parametric, polar, and vector functions.	EK 3.4C2a	EK 3.4C2
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use the Fundamental Theorem of Calculus to evaluate definite integrals.	EK 3.3B2	EK 3.3B2
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use the integral test to determine the convergence of p-series.	EK 4.2C3b	EK 4.2C3
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use the ratio test to determine convergence and divergence.	EK 4.2C2b	EK 4.2C2
Math	HS	AP Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use trapezoidal rule to approximate definite integrals.	EK 3.2B2	EK 3.2B2
Math	HS	Algebra 2	Unit 3 - Quadratics	Represent and/or use imaginary numbers in equivalent forms (e.g., square roots and exponents).	Simplify/write square roots in terms of i (e.g., √-24 = 2i√6).	A2.1.1.1.1	
Math	HS	Algebra 2	Unit 3 - Quadratics	Represent and/or use imaginary numbers in equivalent forms (e.g., square roots and exponents).	Simplify/evaluate expressions involving powers of i.	A2.1.1.1.2	
Math	HS	Algebra 2	Unit 3 - Quadratics	Represent and/or use imaginary numbers in equivalent forms (e.g., square roots and exponents).	Extend the knowledge of arithmetic operations and apply to complex numbers.	CC.2.1.HS.F.6	
Math	HS	Algebra 2	Unit 3 - Quadratics	Apply the order of operations in computation and in problemsolving situations.	Add and subtract complex numbers (e.g., (7 – 3i) – (2 + i) = 5 – 4i).	A2.1.1.2.1	
Math	HS	Algebra 2	Unit 3 - Quadratics	Apply the order of operations in computation and in problemsolving situations.	Multiply and divide complex numbers (e.g., (7 – 3i)(2 + i) = 17 + i).	A2.1.1.2.2	
Math	HS	Algebra 2	Unit 5 - Rational Exponents and Radicals	Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.	Use exponential expressions to represent rational numbers.	A2.1.2.1.1	
Math	HS	Algebra 2	Unit 7 - Exponential and Logarithmic Functions	Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.	Use exponential expressions to represent rational numbers.	A2.1.2.1.1	
Math	**HS**	**Algebra 2**	**Unit 3 - Quadratics**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Simplify/evaluate expressions involving positive and negative exponents and/or roots (may contain all types of real numbers— exponents should not exceed power of 10).**	**A2.1.2.1.2**	
Math	**HS**	**Algebra 2**	**Unit 5 - Rational Exponents and Radicals**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Simplify/evaluate expressions involving positive and negative exponents and/or roots (may contain all types of real numbers— exponents should not exceed power of 10).**	**A2.1.2.1.2**	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Algebra 2	Unit 4 - Polynomials	Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.	Simplify/evaluate expressions involving multiplying with exponents. Note: Limit to rational exponents	A2.1.2.1.3	
	HS	Algebra 2	Unit 5 - Rational Exponents and Radicals	Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.	Simplify/evaluate expressions involving multiplying with exponents. Note: Limit to rational exponents	A2.1.2.1.3	
Math	**HS**	**Algebra 2**	**Unit 7 - Exponential and Logarithmic Functions**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Simplify or evaluate expressions involving logarithms and exponents.**	**A2.1.2.1.4**	
Math	**HS**	**Algebra 2**	**Unit 5 - Rational Exponents and Radicals**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Apply and extend the properties of exponents to solve problems with rational exponents.**	**CC.2.1.HS.F.1**	
Math	**HS**	**Algebra 2**	**Unit 3 - Quadratics**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Write expressions in equivalent forms to solve problems.**	**CC.2.2.HS.D.2**	
Math	**HS**	**Algebra 2**	**Unit 5 - Rational Exponents and Radicals**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Write expressions in equivalent forms to solve problems.**	**CC.2.2.HS.D.2**	
Math	**HS**	**Algebra 2**	**Unit 6 - Rational Functions**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Write expressions in equivalent forms to solve problems.**	**CC.2.2.HS.D.2**	
Math	**HS**	**Algebra 2**	**Unit 7 - Exponential and Logarithmic Functions**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Write expressions in equivalent forms to solve problems.**	**CC.2.2.HS.D.2**	
Math	**HS**	**Algebra 2**	**Unit 3 - Quadratics**	**Simplify expressions involving polynomials.**	**Factor algebraic expressions, including difference of squares and trinomials.**	**A2.1.2.2.1**	
Math	**HS**	**Algebra 2**	**Unit 4 - Polynomials**	**Simplify expressions involving polynomials.**	**Factor algebraic expressions, including difference of squares and trinomials.**	**A2.1.2.2.1**	
Math	**HS**	**Algebra 2**	**Unit 6 - Rational Functions**	**Simplify expressions involving polynomials.**	**Simplify rational algebraic expressions**	**A2.1.2.2.2**	
Math	HS	Algebra 2	Unit 4 - Polynomials	Simplify expressions involving polynomials.	Extend the knowledge of arithmetic operations and apply to polynomials.	CC.2.2.HS.D.3	
Math	**HS**	**Algebra 2**	**Unit 3 - Quadratics**	**Simplify expressions involving polynomials.**	**Understand the relationship between zeros and factors of polynomials to make generalizations about functions and their graphs.**	**CC.2.2.HS.D.4**	
	HS	**Algebra 2**	**Unit 4 - Polynomials**	**Simplify expressions involving polynomials.**	**Understand the relationship between zeros and factors of polynomials to make generalizations about functions and their graphs.**	**CC.2.2.HS.D.4**	
Math	HS	Algebra 2	Unit 4 - Polynomials	Simplify expressions involving polynomials.	Use polynomial identities to solve problems.	CC.2.2.HS.D.5	
Math	**HS**	**Algebra 2**	**Unit 3 - Quadratics**	**Write and/or solve non-linear equations using various methods.**	**Write and/or solve quadratic equations (including factoring and using the Quadratic Formula).**	**A2.1.3.1.1**	
Math	**HS**	**Algebra 2**	**Unit 3 - Quadratics**	**Write and/or solve non-linear equations using various methods.**	**Solve equations involving rational and/or radical expressions (e.g., 10/(x + 3) + 12/(x – 2) = 1 or v(x^2 + 21x) = 14).**	**A2.1.3.1.2**	
Math	**HS**	**Algebra 2**	**Unit 7 - Exponential and Logarithmic Functions**	**Write and/or solve non-linear equations using various methods.**	**Write and/or solve a simple exponential or logarithmic equation (including common and natural logarithms).**	**A2.1.3.1.3**	
Math	**HS**	**Algebra 2**	**Unit 1 - Exploring Functions**	**Write and/or solve non-linear equations using various methods.**	**Write, solve, and/or apply linear or exponential growth or decay (including problem situations).**	**A2.1.3.1.4**	
Math	**HS**	**Algebra 2**	**Unit 7 - Exponential and Logarithmic Functions**	**Write and/or solve non-linear equations using various methods.**	**Write, solve, and/or apply linear or exponential growth or decay (including problem situations).**	**A2.1.3.1.4**	
Math	HS	Algebra 2	Unit 1 - Exploring Functions	Write and/or solve non-linear equations using various methods.	Construct and compare linear, quadratic, and exponential models to solve problems.	CC.2.2.HS.C.5	
Math	HS	Algebra 2	Unit 6 - Rational Functions	Write and/or solve non-linear equations using various methods.	Extend the knowledge of rational functions to rewrite in equivalent forms.	CC.2.2.HS.D.6	
Math	HS	Algebra 2	Unit 1 - Exploring Functions	Write and/or solve non-linear equations using various methods.	Create and graph equations or inequalities to describe numbers or relationships.	CC.2.2.HS.D.7	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Algebra 2	Unit 1 - Exploring Functions	Write and/or solve non-linear equations using various methods.	Apply inverse operations to solve equations or formulas for a given variable.	CC.2.2.HS.D.8	
Math	HS	Algebra 2	Unit 1 - Exploring Functions	Write and/or solve non-linear equations using various methods.	Use reasoning to solve equations, and justify the solution method.	CC.2.2.HS.D.9	
Math	**HS**	**Algebra 2**	**Unit 1 - Exploring Functions**	**Write and/or solve non-linear equations using various methods.**	**Represent,solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.**	**CC.2.2.HS.D.10**	
Math	**HS**	**Algebra 2**	**Unit 2 - Matrices**	**Write and/or solve non-linear equations using various methods.**	**Represent,solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.**	**CC.2.2.HS.D.10**	
Math	**HS**	**Algebra 2**	**Unit 1 - Exploring Functions**	**Describe and/or determine change.**	**Interpret the effects transformations have on functions, and find the inverses of functions.**	**CC.2.2.HS.C.4**	
Math	**HS**	**Algebra 2**	**Unit 3 - Quadratics**	**Describe and/or determine change.**	**Interpret the effects transformations have on functions, and find the inverses of functions.**	**CC.2.2.HS.C.4**	
Math	**HS**	**Algebra 2**	**Unit 1 - Exploring Functions**	**Analyze and/or use patterns or relations.**	**Determine the domain, range, or inverse of a relation.**	**A2.2.1.1.3**	
Math	**HS**	**Algebra 2**	**Unit 3 - Quadratics**	**Analyze and/or use patterns or relations.**	**Determine the domain, range, or inverse of a relation.**	**A2.2.1.1.3**	
Math	**HS**	**Algebra 2**	**Unit 5 - Rational Exponents and Radical Functions**	**Analyze and/or use patterns or relations.**	**Determine the domain, range, or inverse of a relation.**	**A2.2.1.1.3**	
Math	**HS**	**Algebra 2**	**Unit 6 - Rational Functions**	**Analyze and/or use patterns or relations.**	**Determine the domain, range, or inverse of a relation.**	**A2.2.1.1.3**	
Math	**HS**	**Algebra 2**	**Unit 7 - Exponential and Logarithmic Functions**	**Analyze and/or use patterns or relations.**	**Determine the domain, range, or inverse of a relation.**	**A2.2.1.1.3**	
Math	**HS**	**Algebra 2**	**Unit 3 - Quadratics**	**Analyze and/or use patterns or relations.**	**Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increase/decrease, intercepts, zeros, and asymptotes).**	**A2.2.1.1.4**	
Math	**HS**	**Algebra 2**	**Unit 4 - Polynomials**	**Analyze and/or use patterns or relations.**	**Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increase/decrease, intercepts, zeros, and asymptotes).**	**A2.2.1.1.4**	
Math	**HS**	**Algebra 2**	**Unit 6 - Rational Functions**	**Analyze and/or use patterns or relations.**	**Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increase/decrease, intercepts, zeros, and asymptotes).**	**A2.2.1.1.4**	
Math	**HS**	**Algebra 2**	**Unit 7 - Exponential and Logarithmic Functions**	**Analyze and/or use patterns or relations.**	**Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increase/decrease, intercepts, zeros, and asymptotes).**	**A2.2.1.1.4**	
Math	HS	Algebra 2	Unit 3 - Quadratics	Analyze and/or use patterns or relations.	Apply concepts of complex numbers in polynomial identities and quadratic equations to solve problems.	CC.2.1.HS.F.7	
Math	HS	Algebra 2	Unit 1 - Exploring Functions	Analyze and/or use patterns or relations.	Construct and compare linear, quadratic, and exponential models to solve problems.	CC.2.2.HS.C.5	
Math	HS	Algebra 2	Unit 4 - Polynomials	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Create, interpret, and/or use the equation, graph, or table of a polynomial function (including quadratics).	A2.2.2.1.1	
Math	HS	Algebra 2	Unit 7 - Exponential and Logarithmic Functions	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Create, interpret, and/or use the equation, graph, or table of an exponential or logarithmic function (including common and natural logarithms).	A2.2.2.1.2	
Math	HS	Algebra 2	Unit 4 - Polynomials	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Determine, use, and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential, or logarithmic function.	A2.2.2.1.3	
Math	HS	Algebra 2	Unit 7 - Exponential and Logarithmic Functions	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Determine, use, and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential, or logarithmic function.	A2.2.2.1.3	
Math	HS	Algebra 2	Unit 4 - Polynomials	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Translate a polynomial, exponential, or logarithmic function from one representation of a function to another (graph, table, and equation).	A2.2.2.1.4	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Algebra 2	Unit 7 - Exponential and Logarithmic Functions	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Translate a polynomial, exponential, or logarithmic function from one representation of a function to another (graph, table, and equation).	A2.2.2.1.4	
Math	HS	Algebra 2	Unit 1 - Exploring Functions	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Interpret the effects transformations have on functions, and find the inverses of functions.	CC.2.2.HS.C.4	
Math	HS	Algebra 2	Unit 5 - Rational Exponents and Radical Equations	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Interpret the effects transformations have on functions, and find the inverses of functions.	CC.2.2.HS.C.4	
Math	HS	Algebra 2	Unit 3 - Quadratics	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Construct and compare linear, quadratic, and exponential models to solve problems.	CC.2.2.HS.C.5	
Math	HS	Algebra 2	Unit 1 - Exploring Functions	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Create and graph equations or inequalities to describe numbers or relationships.	CC.2.2.HS.D.7	
Math	HS	Algebra 2	Unit 5 - Rational Exponents and Radical Equations	Describe and/or determine families of functions.	Identify or describe the effect of changing parameters within a family of functions (e.g., y = x^2 and y = x^2 + 3, or y = x^2 and y = 3x^2).	A2.2.2.2.1	
Math	HS	Algebra 2	Unit 6 - Rational Functions	Describe and/or determine families of functions.	Identify or describe the effect of changing parameters within a family of functions (e.g., y = x^2 and y = x^2 + 3, or y = x^2 and y = 3x^2).	A2.2.2.2.1	
Math	HS	Algebra 2	Unit 6 - Rational Functions	Describe and/or determine families of functions.	Interpret the effects transformations have on functions, and find the inverses of functions.	CC.2.2.HS.C.4	
Math	HS	Algebra 2	Unit 7 - Exponential and Logarithmic Functions	Describe and/or determine families of functions.	Construct and compare linear, quadratic, and exponential models to solve problems.	CC.2.2.HS.C.5	
Math	HS	Algebra 2	Unit 1 - Exploring Functions	Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions.	Draw, identify, find, interpret, and/or write an equation for a regression model (lines and curves of best fit) for a scatter plot.	A2.2.3.1.1	
Math	HS	Algebra 2	Unit 1 - Exploring Functions	Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions.	Make predictions using the equations or graphs of regression models (lines and curves of best fit) of scatter plots.	A2.2.3.1.2	
Math	HS	Algebra 2	Unit 8 - Probability and Statistics	Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions.	Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs, and data displays.	CC.2.1.HS.F.3	
Math	HS	Algebra 2	Unit 8 - Probability and Statistics	Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions.	Summarize, represent, and interpret data on two categorical and quantitative variables.	CC.2.4.HS.B.2	
Math	HS	Algebra 2	Unit 1 - Exploring Functions	Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions.	Analyze linear models to make interpretations based on the data.	CC.2.4.HS.B.3	
Math	**HS**	**Algebra 2**	**Unit 8 - Probability and Statistics**	**Apply probability to practical situations.**	**Use combinations, permutations, and the fundamental counting principle to solve problems involving probability.**	**A2.2.3.2.1**	
Math	HS	Algebra 2	Unit 8 - Probability and Statistics	Apply probability to practical situations.	Use odds to find probability and/or use probability to find odds	A2.2.3.2.2	
Math	**HS**	**Algebra 2**	**Unit 8 - Probability and Statistics**	**Apply probability to practical situations.**	**Use probability for independent, dependent, or compound events to predict outcomes.**	**A2.2.3.2.3**	
Math	HS	Algebra 2	Unit 8 - Probability and Statistics	Apply probability to practical situations.	Use the concepts of independence and conditional probability to interpret data.	CC.2.4.HS.B.6	
Math	HS	Algebra 2	Unit 8 - Probability and Statistics	Apply probability to practical situations.	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	CC.2.4.HS.B.7	
Math	**HS**	**Algebra 2**	**Unit 2 - Matrices**	**Write and/or solve non-linear equations using various methods.**	**Solve systems of three equations.**	**CYMAAL2H.D.2.13**	
Math	HS	Algebra 2	Unit 2 - Matrices	Write and/or solve non-linear equations using various methods.	Add, subtract, and multiply matrices.	CYMAAL2H.D.2.14	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Honors Algebra 2	Unit 1 - Quadratics	Represent and/or use imaginary numbers in equivalent forms (e.g., square roots and exponents).	Simplify/write square roots in terms of i (e.g., √-24 = 2i√6).	A2.1.1.1.1	
Math	HS	Honors Algebra 2	Unit 1 - Quadratics	Represent and/or use imaginary numbers in equivalent forms (e.g., square roots and exponents).	Simplify/evaluate expressions involving powers of i.	A2.1.1.1.2	
Math	HS	Honors Algebra 2	Unit 1 - Quadratics	Represent and/or use imaginary numbers in equivalent forms (e.g., square roots and exponents).	Extend the knowledge of arithmetic operations and apply to complex numbers.	CC.2.1.HS.F.6	
Math	HS	Honors Algebra 2	Unit 1 - Quadratics	Apply the order of operations in computation and in problemsolving situations.	Add and subtract complex numbers (e.g., (7 – 3i) – (2 + i) = 5 – 4i).	A2.1.1.2.1	
Math	HS	Honors Algebra 2	Unit 1 - Quadratics	Apply the order of operations in computation and in problemsolving situations.	Multiply and divide complex numbers (e.g., (7 – 3i)(2 + i) = 17 + i).	A2.1.1.2.2	
Math	HS	Honors Algebra 2	Unit 3 - Rational Exponents and Radicals	Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.	Use exponential expressions to represent rational numbers.	A2.1.2.1.1	
Math	HS	Honors Algebra 2	Unit 4 - Exponential and Logarithmic Functions	Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.	Use exponential expressions to represent rational numbers.	A2.1.2.1.1	
Math	**HS**	**Honors Algebra 2**	**Unit 1 - Quadratics**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Simplify/evaluate expressions involving positive and negative exponents and/or roots (may contain all types of real numbers— exponents should not exceed power of 10).**	**A2.1.2.1.2**	
Math	**HS**	**Honors Algebra 2**	**Unit 3 - Rational Exponents and Radicals**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Simplify/evaluate expressions involving positive and negative exponents and/or roots (may contain all types of real numbers— exponents should not exceed power of 10).**	**A2.1.2.1.2**	
Math	HS	Honors Algebra 2	Unit 2 - Polynomials	Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.	Simplify/evaluate expressions involving multiplying with exponents. Note: Limit to rational exponents	A2.1.2.1.3	
	HS	Honors Algebra 2	Unit 3 - Rational Exponents and Radicals	Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.	Simplify/evaluate expressions involving multiplying with exponents. Note: Limit to rational exponents	A2.1.2.1.3	
Math	**HS**	**Honors Algebra 2**	**Unit 4 - Exponential and Logarithmic Functions**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Simplify or evaluate expressions involving logarithms and exponents.**	**A2.1.2.1.4**	
Math	**HS**	**Honors Algebra 2**	**Unit 3 - Rational Exponents and Radicals**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Apply and extend the properties of exponents to solve problems with rational exponents.**	**CC.2.1.HS.F.1**	
Math	**HS**	**Honors Algebra 2**	**Unit 1 - Quadratics**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Write expressions in equivalent forms to solve problems.**	**CC.2.2.HS.D.2**	
Math	**HS**	**Honors Algebra 2**	**Unit 3 - Rational Exponents and Radicals**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Write expressions in equivalent forms to solve problems.**	**CC.2.2.HS.D.2**	
Math	**HS**	**Honors Algebra 2**	**Unit 5 - Rational Functions**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Write expressions in equivalent forms to solve problems.**	**CC.2.2.HS.D.2**	
Math	**HS**	**Honors Algebra 2**	**Unit 4 - Exponential and Logarithmic Functions**	**Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.**	**Write expressions in equivalent forms to solve problems.**	**CC.2.2.HS.D.2**	
Math	**HS**	**Honors Algebra 2**	**Unit 1 - Quadratics**	**Simplify expressions involving polynomials.**	**Factor algebraic expressions, including difference of squares and trinomials.**	**A2.1.2.2.1**	
Math	**HS**	**Honors Algebra 2**	**Unit 2 - Polynomials**	**Simplify expressions involving polynomials.**	**Factor algebraic expressions, including difference of squares and trinomials.**	**A2.1.2.2.1**	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	**HS**	**Honors Algebra 2**	**Unit 5 - Rational Functions**	**Simplify expressions involving polynomials.**	**Simplify rational algebraic expressions**	**A2.1.2.2.2**	
Math	HS	Honors Algebra 2	Unit 2 - Polynomials	Simplify expressions involving polynomials.	Extend the knowledge of arithmetic operations and apply to polynomials.	CC.2.2.HS.D.3	
Math	**HS**	**Honors Algebra 2**	**Unit 1 - Quadratics**	**Simplify expressions involving polynomials.**	**Understand the relationship between zeros and factors of polynomials to make generalizations about functions and their graphs.**	**CC.2.2.HS.D.4**	
Math	**HS**	**Honors Algebra 2**	**Unit 2 - Polynomials**	**Simplify expressions involving polynomials.**	**Understand the relationship between zeros and factors of polynomials to make generalizations about functions and their graphs.**	**CC.2.2.HS.D.4**	
Math	HS	Honors Algebra 2	Unit 2 - Polynomials	Simplify expressions involving polynomials.	Use polynomial identities to solve problems.	CC.2.2.HS.D.5	
Math	**HS**	**Honors Algebra 2**	**Unit 1 - Quadratics**	**Write and/or solve non-linear equations using various methods.**	**Write and/or solve quadratic equations (including factoring and using the Quadratic Formula).**	**A2.1.3.1.1**	
Math	**HS**	**Honors Algebra 2**	**Unit 1 - Quadratics**	**Write and/or solve non-linear equations using various methods.**	**Solve equations involving rational and/or radical expressions (e.g., 10/(x + 3) + 12/(x – 2) = 1 or √(x^2 + 21x) = 14).**	**A2.1.3.1.2**	
Math	**HS**	**Honors Algebra 2**	**Unit 4 - Exponential and Logarithmic Functions**	**Write and/or solve non-linear equations using various methods.**	**Write and/or solve a simple exponential or logarithmic equation (including common and natural logarithms).**	**A2.1.3.1.3**	
Math	**HS**	**Honors Algebra 2**	**Unit 0 - Exploring Functions**	**Write and/or solve non-linear equations using various methods.**	**Write, solve, and/or apply linear or exponential growth or decay (including problem situations).**	**A2.1.3.1.4**	
Math	**HS**	**Honors Algebra 2**	**Unit 4 - Exponential and Logarithmic Functions**	**Write and/or solve non-linear equations using various methods.**	**Write, solve, and/or apply linear or exponential growth or decay (including problem situations).**	**A2.1.3.1.4**	
Math	HS	Honors Algebra 2	Unit 0 - Exploring Functions	Write and/or solve non-linear equations using various methods.	Construct and compare linear, quadratic, and exponential models to solve problems.	CC.2.2.HS.C.5	
Math	HS	Honors Algebra 2	Unit 5 - Rational Functions	Write and/or solve non-linear equations using various methods.	Extend the knowledge of rational functions to rewrite in equivalent forms.	CC.2.2.HS.D.6	
Math	HS	Honors Algebra 2	Unit 0 - Exploring Functions	Write and/or solve non-linear equations using various methods.	Create and graph equations or inequalities to describe numbers or relationships.	CC.2.2.HS.D.7	
Math	HS	Honors Algebra 2	Unit 0 - Exploring Functions	Write and/or solve non-linear equations using various methods.	Apply inverse operations to solve equations or formulas for a given variable.	CC.2.2.HS.D.8	
Math	HS	Honors Algebra 2	Unit 0 - Exploring Functions	Write and/or solve non-linear equations using various methods.	Use reasoning to solve equations, and justify the solution method.	CC.2.2.HS.D.9	
Math	**HS**	**Honors Algebra 2**	**Unit 0 - Exploring Functions**	**Write and/or solve non-linear equations using various methods.**	**Represent,solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.**	**CC.2.2.HS.D.10**	
Math	**HS**	**Honors Algebra 2**	**Unit 8 - Matrices**	**Write and/or solve non-linear equations using various methods.**	**Represent,solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.**	**CC.2.2.HS.D.10**	
Math	**HS**	**Honors Algebra 2**	**Unit 0 - Exploring Functions**	**Describe and/or determine change.**	**Interpret the effects transformations have on functions, and find the inverses of functions.**	**CC.2.2.HS.C.4**	
Math	**HS**	**Honors Algebra 2**	**Unit 1 - Quadratics**	**Describe and/or determine change.**	**Interpret the effects transformations have on functions, and find the inverses of functions.**	**CC.2.2.HS.C.4**	
Math	**HS**	**Honors Algebra 2**	**Unit 0 - Exploring Functions**	**Analyze and/or use patterns or relations.**	**Determine the domain, range, or inverse of a relation.**	**A2.2.1.1.3**	
Math	**HS**	**Honors Algebra 2**	**Unit 1 - Quadratics**	**Analyze and/or use patterns or relations.**	**Determine the domain, range, or inverse of a relation.**	**A2.2.1.1.3**	
Math	**HS**	**Honors Algebra 2**	**Unit 3 - Rational Exponents and Radical Functions**	**Analyze and/or use patterns or relations.**	**Determine the domain, range, or inverse of a relation.**	**A2.2.1.1.3**	
Math	**HS**	**Honors Algebra 2**	**Unit 5 - Rational Functions**	**Analyze and/or use patterns or relations.**	**Determine the domain, range, or inverse of a relation.**	**A2.2.1.1.3**	
Math	**HS**	**Honors Algebra 2**	**Unit 4 - Exponential and Logarithmic Functions**	**Analyze and/or use patterns or relations.**	**Determine the domain, range, or inverse of a relation.**	**A2.2.1.1.3**	
Math	**HS**	**Honors Algebra 2**	**Unit 1 - Quadratics**	**Analyze and/or use patterns or relations.**	**Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increase/decrease, intercepts, zeros, and asymptotes).**	**A2.2.1.1.4**	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	**HS**	**Honors Algebra 2**	**Unit 2 - Polynomials**	**Analyze and/or use patterns or relations.**	**Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increase/decrease, intercepts, zeros, and asymptotes).**	**A2.2.1.1.4**	
Math	**HS**	**Honors Algebra 2**	**Unit 5 - Rational Functions**	**Analyze and/or use patterns or relations.**	**Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increase/decrease, intercepts, zeros, and asymptotes).**	**A2.2.1.1.4**	
Math	**HS**	**Honors Algebra 2**	**Unit 4 - Exponential and Logarithmic Functions**	**Analyze and/or use patterns or relations.**	**Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increase/decrease, intercepts, zeros, and asymptotes).**	**A2.2.1.1.4**	
Math	HS	Honors Algebra 2	Unit 1 - Quadratics	Analyze and/or use patterns or relations.	Apply concepts of complex numbers in polynomial identities and quadratic equations to solve problems.	CC.2.1.HS.F.7	
Math	HS	Honors Algebra 2	Unit 0 - Exploring Functions	Analyze and/or use patterns or relations.	Construct and compare linear, quadratic, and exponential models to solve problems.	CC.2.2.HS.C.5	
Math	HS	Honors Algebra 2	Unit 2 - Polynomials	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Create, interpret, and/or use the equation, graph, or table of a polynomial function (including quadratics).	A2.2.2.1.1	
Math	HS	Honors Algebra 2	Unit 4 - Exponential and Logarithmic Functions	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Create, interpret, and/or use the equation, graph, or table of an exponential or logarithmic function (including common and natural logarithms).	A2.2.2.1.2	
Math	HS	Honors Algebra 2	Unit 2 - Polynomials	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Determine, use, and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential, or logarithmic function.	A2.2.2.1.3	
Math	HS	Honors Algebra 2	Unit 4 - Exponential and Logarithmic Functions	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Determine, use, and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential, or logarithmic function.	A2.2.2.1.3	
Math	HS	Honors Algebra 2	Unit 2 - Polynomials	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Translate a polynomial, exponential, or logarithmic function from one representation of a function to another (graph, table, and equation).	A2.2.2.1.4	
Math	HS	Honors Algebra 2	Unit 4 - Exponential and Logarithmic Functions	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Translate a polynomial, exponential, or logarithmic function from one representation of a function to another (graph, table, and equation).	A2.2.2.1.4	
Math	HS	Honors Algebra 2	Unit 0 - Exploring Functions	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Interpret the effects transformations have on functions, and find the inverses of functions.	CC.2.2.HS.C.4	
Math	HS	Honors Algebra 2	Unit 3 - Rational Exponents and Radical Equations	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Interpret the effects transformations have on functions, and find the inverses of functions.	CC.2.2.HS.C.4	
Math	HS	Honors Algebra 2	Unit 1 - Quadratics	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Construct and compare linear, quadratic, and exponential models to solve problems.	CC.2.2.HS.C.5	
Math	HS	Honors Algebra 2	Unit 0 - Exploring Functions	Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.	Create and graph equations or inequalities to describe numbers or relationships.	CC.2.2.HS.D.7	
Math	HS	Honors Algebra 2	Unit 3 - Rational Exponents and Radical Equations	Describe and/or determine families of functions.	Identify or describe the effect of changing parameters within a family of functions (e.g., y = x^2 and y = x^2 + 3, or y = x^2 and y = 3x^2).	A2.2.2.2.1	
Math	HS	Honors Algebra 2	Unit 5 - Rational Functions	Describe and/or determine families of functions.	Identify or describe the effect of changing parameters within a family of functions (e.g., y = x^2 and y = x^2 + 3, or y = x^2 and y = 3x^2).	A2.2.2.2.1	
Math	HS	Honors Algebra 2	Unit 5 - Rational Functions	Describe and/or determine families of functions.	Interpret the effects transformations have on functions, and find the inverses of functions.	CC.2.2.HS.C.4	
Math	HS	Honors Algebra 2	Unit 4 - Exponential and Logarithmic Functions	Describe and/or determine families of functions.	Construct and compare linear, quadratic, and exponential models to solve problems.	CC.2.2.HS.C.5	
Math	HS	Honors Algebra 2	Unit 0 - Exploring Functions	Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions.	Draw, identify, find, interpret, and/or write an equation for a regression model (lines and curves of best fit) for a scatter plot.	A2.2.3.1.1	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Honors Algebra 2	Unit 0 - Exploring Functions	Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions.	Make predictions using the equations or graphs of regression models (lines and curves of best fit) of scatter plots.	A2.2.3.1.2	
Math	HS	Honors Algebra 2	Unit 6 - Probability and Statistics	Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions.	Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs, and data displays.	CC.2.1.HS.F.3	
Math	HS	Honors Algebra 2	Unit 6 - Probability and Statistics	Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions.	Summarize, represent, and interpret data on two categorical and quantitative variables.	CC.2.4.HS.B.2	
Math	HS	Honors Algebra 2	Unit 0 - Exploring Functions	Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions.	Analyze linear models to make interpretations based on the data.	CC.2.4.HS.B.3	
Math	**HS**	**Honors Algebra 2**	**Unit 6 - Probability and Statistics**	**Apply probability to practical situations.**	**Use combinations, permutations, and the fundamental counting principle to solve problems involving probability.**	**A2.2.3.2.1**	
Math	HS	Honors Algebra 2	Unit 6 - Probability and Statistics	Apply probability to practical situations.	Use odds to find probability and/or use probability to find odds	A2.2.3.2.2	
Math	**HS**	**Honors Algebra 2**	**Unit 6 - Probability and Statistics**	**Apply probability to practical situations.**	**Use probability for independent, dependent, or compound events to predict outcomes.**	**A2.2.3.2.3**	
Math	HS	Honors Algebra 2	Unit 6 - Probability and Statistics	Apply probability to practical situations.	Use the concepts of independence and conditional probability to interpret data.	CC.2.4.HS.B.6	
Math	HS	Honors Algebra 2	Unit 6 - Probability and Statistics	Apply probability to practical situations.	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	CC.2.4.HS.B.7	
Math	**HS**	**Algebra 2**	**Unit 7 - Sequences & Series**	**Analyze and/or use patterns or relations.**	**Analyze a set of data for the existence of a pattern, and represent the pattern with a rule algebraically and/or graphically.**	**A2.2.1.1.1**	
Math	HS	Algebra 2	Unit 7 - Sequences & Series	Analyze and/or use patterns or relations.	Identify and/or extend a pattern as either an arithmetic or geometric sequence (e.g., given a geometric sequence, find the 20th term).	A2.2.1.1.2	
Math	**HS**	**Algebra 2**	**Unit 7 - Sequences & Series**	**Describe and/or determine change.**	**Write functions or sequences that model relationships between two quantities.**	**CC.2.2.HS.C.3**	
Math	**HS**	**Algebra 2**	**Unit 8 - Matrices**	**Write and/or solve non-linear equations using various methods.**	**Solve systems of three equations.**	**CYMAAL2H.D.2.13**	
Math	HS	Algebra 2	Unit 8 - Matrices	Write and/or solve non-linear equations using various methods.	Add, subtract, and multiply matrices.	CYMAAL2H.D.2.14	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Identify the observational units and variables in a data set.	CYMAAPST.E.1.01	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Classify variables as quantitative or categorical.	CYMAAPST.E.1.02	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Construct boxplots, dotplots, stemplots, timeplots, and histograms of quantitative data.	CYMAAPST.E.1.03	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Construct bar graphs of categorical data.	CYMAAPST.E.1.04	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Use density curves to compare the center and spread within and between group variation.	CYMAAPST.E.1.05	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Differentiate between the median and mean of a density curve.	CYMAAPST.E.1.06	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Construct two-way (contingency) tables for two categorical variables.	CYMAAPST.E.1.07	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Describe statistical tendencies from graphical displays of data.	CYMAAPST.E.1.08	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Determine if two categorical variables are independent or if they have an association by creating segmented bar graphs.	CYMAAPST.E.1.09	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Compare the distribution of a quantitative variable between two groups by creating parallel boxplots, dotplots, stemplots, timeplots, or histograms.	CYMAAPST.E.1.10	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Construct a scatterplot of two quantitative variables.	CYMAAPST.E.1.11	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Describe the shape, direction, and strength of the association of two quantitative variables from a scatterplot.	CYMAAPST.E.1.12	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Classify the shape of the distribution of a quantitative variable as symmetric, skewed to the left, or skewed to the right.	CYMAAPST.E.2.01	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Identify clusters, gaps, and potential outliers in a data set by looking at boxplots, dotplots, stemplots, timeplots, or histograms.	CYMAAPST.E.2.02	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate the median and mean of a data set.	CYMAAPST.E.2.03	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Choose the median or mean as the most appropriate measure of center for a data set.	CYMAAPST.E.2.04	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Relate the median and mean to the shape of the data set.	CYMAAPST.E.2.05	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Explain the effect of outliers on the value of the mean and median in data.	CYMAAPST.E.2.06	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate the standard deviation, interquartile range (IQR), and five number summary of a data set.	CYMAAPST.E.2.07	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Choose the IQR or standard deviation as the most appropriate measure of spread for a data set.	CYMAAPST.E.2.08	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate the z-score of a datum as a measure of its position.	CYMAAPST.E.2.09	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Determine the summary statistics for a variable that has undergone a linear transformation.	CYMAAPST.E.2.10	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Determine if a datum is an outlier using the 1.5´IQR criteria.	CYMAAPST.E.2.11	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate the percentile and quartile of a datum in a data set.	CYMAAPST.E.2.12	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Define properties of a normal distribution.	CYMAAPST.E.2.13	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Find probabilities in Normal density curves.	CYMAAPST.E.2.14	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Find data values given percentile values (Normal probabilities).	CYMAAPST.E.2.15	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate and interpret the correlation coefficient of two quantitative variables.	CYMAAPST.E.2.16	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate the least-squares regression model for two quantitative variables.	CYMAAPST.E.2.17	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Interpret the slope and intercept of least-squares regression model.	CYMAAPST.E.2.18	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Determine if an observation is influential in the least-squares regression setting.	CYMAAPST.E.2.19	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate and interpret the value of the coefficient of determination.	CYMAAPST.E.2.20	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Explain the danger of extrapolation.	CYMAAPST.E.2.21	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate and interpret the residual of a data value.	CYMAAPST.E.2.22	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Create a residual plot of a data set given its least-squares regression model.	CYMAAPST.E.2.23	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Create the marginal distribution of a categorical variable in a data set with two categorical variables.	CYMAAPST.E.2.24	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Create the conditional distribution of one category of a categorical variable among the categories of another categorical variable.	CYMAAPST.E.2.25	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate the relative risk of one category of a categorical variable among two groups.	CYMAAPST.E.2.26	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Use power and logarithmic transformations to achieve linearity in a data set, calculate the least-squares regression model for the transformed data, and un-transform the model.	CYMAAPST.E.2.27	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Conduct simulations of random phenomena to estimate probabilities of events.	CYMAAPST.E.3.01	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	List the sample space of a random phenomenon.	CYMAAPST.E.3.02	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Define the law of large numbers as it relates to random variables.	CYMAAPST.E.3.03	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Identify valid probability models.	CYMAAPST.E.3.04	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Calculate theoretical probabilities using the general addition rule.	CYMAAPST.E.3.05	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Calculate theoretical probabilities using the general multiplication rule.	CYMAAPST.E.3.06	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Calculate conditional probabilities.	CYMAAPST.E.3.07	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Define a random variable.	CYMAAPST.E.3.08	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Create the probability distribution of a discrete random variable.	CYMAAPST.E.3.09	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Calculate the expected value (mean) and standard deviation of a discrete random variable.	CYMAAPST.E.3.10	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Find the probability of an event for a discrete random variable.	CYMAAPST.E.3.11	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Find the probability of an event for a continuous random variable, given its density curve.	CYMAAPST.E.3.12	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Calculate the mean and standard deviation for sums and differences of independent random variables.	CYMAAPST.E.3.13	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Identify binomial random variables.	CYMAAPST.E.3.14	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Calculate the mean and standard deviation for binomial random variables.	CYMAAPST.E.3.15	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Compute binomial probabilities exactly.	CYMAAPST.E.3.16	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Compute binomial probabilities using the Normal approximation to the Binomial.	CYMAAPST.E.3.17	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Identify geometric random variables.	CYMAAPST.E.3.18	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Calculate the mean and standard deviation for geometric random variables.	CYMAAPST.E.3.19	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Compute geometric probabilities exactly.	CYMAAPST.E.3.20	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Define and give examples of populations and samples.	CYMAAPST.E.4.01	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Define and give examples of parameters and statistics.	CYMAAPST.E.4.02	

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Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Identify the response variable and the explanatory variable in a statistical study.	CYMAAPST.E.4.03	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Differentiate between observational studies and experiments.	CYMAAPST.E.4.04	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Draw a simple random sample (SRS) from a population.	CYMAAPST.E.4.05	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Describe the characteristics of a well-designed and well-conducted survey.	CYMAAPST.E.4.06	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Differentiate between population distributions, sample distributions, and sampling distributions.	CYMAAPST.E.4.07	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Identify various sources of bias in surveys.	CYMAAPST.E.4.08	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Differentiate between simple random samples, stratified samples, cluster samples, and systematic samples.	CYMAAPST.E.4.09	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Identify the treatments, control groups, and experimental units in an experiment.	CYMAAPST.E.4.10	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Explain how randomization, control, and replication are present (or not present) in an experiment.	CYMAAPST.E.4.11	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Identify sources of bias and confounding, including the placebo effect and blinding.	CYMAAPST.E.4.12	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Describe a process to randomly assign experimental units to treatment groups.	CYMAAPST.E.4.13	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Design an experiment using the completely randomized design, the randomized block design, or the matched-pairs design.	CYMAAPST.E.4.14	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Define an unbiased estimator of a parameter.	CYMAAPST.E.4.15	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Give examples of sampling variability.	CYMAAPST.E.4.16	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Simulate the sampling distribution of a sample proportion.	CYMAAPST.E.4.17	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Describe the shape, mean, and standard deviation of the sampling distribution of a sample proportion using the Central Limit Theorem.	CYMAAPST.E.4.18	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Simulate the sampling distribution of a sample mean.	CYMAAPST.E.4.19	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Calculate probabilities of intervals of sample proportions from their sampling distributions.	CYMAAPST.E.4.20	

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Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Describe the shape, mean, and standard deviation of the sampling distribution of a sample mean using the Central Limit Theorem.	CYMAAPST.E.4.21	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Compute probabilities of intervals of t-values from the t distributions.	CYMAAPST.E.4.22	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Calculate probabilities of intervals of sample means from their sampling distributions.	CYMAAPST.E.4.23	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Construct and interpret a confidence interval for population proportion from sample data.	CYMAAPST.E.4.24	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Construct and interpret a confidence interval for population mean from sample data.	CYMAAPST.E.4.25	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Conduct and interpret a test of significance about a population proportion from sample data.	CYMAAPST.E.4.26	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Conduct and interpret a test of significance about a population mean from sample data.	CYMAAPST.E.4.27	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Explain the duality of two-sided confidence intervals and tests of significance.	CYMAAPST.E.4.28	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Describe Type I and Type II errors in context and state the consequences of each type of error.	CYMAAPST.E.4.29	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Explain the concept of the power of a test of significance.	CYMAAPST.E.4.30	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Calculate and interpret confidence intervals for the difference between two population proportions.	CYMAAPST.E.4.31	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Conduct and interpret tests of significance for the difference between two population proportions.	CYMAAPST.E.4.32	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Calculate and interpret confidence intervals for the difference between two population means.	CYMAAPST.E.4.33	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Conduct and interpret tests of significance for the difference between two population means.	CYMAAPST.E.4.34	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Conduct and interpret tests of significance for the mean of a difference in paired data.	CYMAAPST.E.4.35	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Conduct and interpret a chi-square test for Goodness-of-Fit on a categorical variable.	CYMAAPST.E.4.36	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Conduct and interpret a chi-square test for a two-way table (Test for Homogeneity of Populations and Test for Independence).	CYMAAPST.E.4.37	
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Calculate and interpret a confidence interval for the slope of a least-squares regression equation.	CYMAAPST.E.4.38	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	AP Statistics	[Introduction to Applied Statistics] Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Conduct and interpret a test of significance for the slope of a least-squares regression equation (or for the linear association between two variables).	CYMAAPST.E.4.39	
Math	HS	Honors Calculus	Numbers and Operations	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Represent the limiting process verbally, analytically, graphically, and numerically.	EK 1.1A1	EK 1.1A1
Math	HS	Honors Calculus	Geometry	Locate points or describe relationships using the coordinate plane.	Use limits to define and test for continuity.	EK 1.1A1b	EK 1.1A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use graphs and tables to estimate one- and two-sided limits.	EK 1.1A2a	EK 1.1A2
Math	HS	Honors Calculus	Geometry	Locate points or describe relationships using the coordinate plane.	Describe asymptotic behavior in terms of limits involving infinity.	EK 1.1A2b	EK 1.1A2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use algebra to calculate one- and two-sided limits.	EK 1.1A2c	EK 1.1A2
Math	HS	Honors Calculus	Geometry	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Make connections between asymptotes and graphical behavior.	EK 1.2A3a	EK 1.2A3
Math	HS	Honors Calculus	Geometry	Identify and/or apply concepts of transformations or symmetry.	Determine points of nondifferentiability, and classify those points as corners, vertical tangents, cusps, or discontinuities.	EK 1.2A3b	EK 1.2A3
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use the Intermediate value theorem and the Extreme Value theorem to represent continuity geometrically.	EK 1.2B1a	EK 1.2B1
Math	HS	Honors Calculus	Geometry	Locate points or describe relationships using the coordinate plane.	Use the Mean Value Theorem to connect the average rate of change of a function over an interval to the instantaneous rate of change of a function at a point.	EK 1.2B1b	EK 1.2B1
Math	HS	Honors Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Define the derivative as the slope (instantaneous rate of change) or a curve at a point.	EK 2.1A1a	EK 2.1A1
Math	HS	Honors Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Define instantaneous rate of change as the limit of average rate of change.	EK 2.1A1b	EK 2.1A1
Math	HS	Honors Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Define the derivative as the limit of the difference quotient.	EK 2.1A2	EK 2.1A2
Math	HS	Honors Calculus	Numbers and Operations	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Represent the derivative verbally, analytically, graphically, and numerically.	EK 2.1A5	EK 2.1A5
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find velocity and acceleration from position using analytic, numeric, and graphical methods.	EK 2.1C1	EK 2.1C1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find derivatives of inverse functions.	EK 2.1C2b	EK 2.1C2
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find derivatives of logarithmic functions.	EK 2.1C2c	EK 2.1C2
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find derivatives using the power, sum, product, and quotient rules.	EK 2.1C3	EK 2.1C3
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find derivatives using the chain rule.	EK 2.1C4	EK 2.1C4
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find first and second derivatives using implicit differentiation.	EK 2.1C5a	EK 2.1C5
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Use implicit differentiation to find the derivative of the inverse of a function.	EK 2.1C5b	EK 2.1C5
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find higher order derivatives.	EK 2.1D1	EK 2.1D1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use the values of f' to represent the slopes of f.	EK 2.2A1a	EK 2.2A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use the values of f" to represent the concavity of f.	EK 2.2A1b	EK 2.2A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use f' and f" to determine when f is increasing or decreasing.	EK 2.2A1c	EK 2.2A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use f' and f" to determine the concavity of f.	EK 2.2A1d	EK 2.2A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use f" to determine the inflection points of f.	EK 2.2A1e	EK 2.2A1

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Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use f' to determine the critical points of f.	EK 2.2A1f	EK 2.2A1
Math	HS	Honors Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Distinguish between absolute and local extreme values.	EK 2.2A1g	EK 2.2A1
Math	HS	Honors Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Approximate rate of change from graphs and tables of values.	EK 2.2A2a	EK 2.2A2
Math	HS	Honors Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Approximate derivatives for functions represented by graphs and by tables of values.	EK 2.2A2b	EK 2.2A2
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use the graph of f to draw the graphs of f' and f'' and vice versa.	EK 2.2A3a	EK 2.2A3
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Make connections between the corresponding characteristics of the graphs of f, f' and f''.	EK 2.2A3b	EK 2.2A3
Math	HS	Honors Calculus	Numbers and Operations	Understand the meanings of operations, use operations, and understand how they relate to each other.	Describe the relationship between differentiability and continuity.	EK 2.2B2	EK 2.2B2
Math	HS	Honors Calculus	Numbers and Operations	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Represent the Mean Value Theorem verbally, analytically, and graphically.	EK 2.3B1a	EK 2.3B1
Math	HS	Honors Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Find the slope (instantaneous rate of change) of a curve at a point.	EK 2.3B1b	EK 2.3B1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find the equation of a tangent or normal line to a curve at a point.	EK 2.3B1c	EK 2.3B1
Math	HS	Honors Calculus	Numbers and Operations	Compute accurately and fluently and make reasonable estimates.	Use local linear approximations to approximate values of functions.	EK 2.3B2	EK 2.3B2
Math	HS	Honors Calculus	Geometry	Locate points or describe relationships using the coordinate plane.	Graph velocity and acceleration from position and vice versa.	EK 2.3C1a	EK 2.3C1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Analyze particle motion along a line, including position, displacement, and total distance.	EK 2.3C1b	EK 2.3C1
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use related rates equations to determine rates of change of functions with respect to time.	EK 2.3C2	EK 2.3C2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Apply properties of derivatives to maximize and minimize quantities.	EK 2.3C3a	EK 2.3C3
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use algebraic and graphical methods to solve optimization problems in a variety of contexts.	EK 2.3C3b	EK 2.3C3
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Compare the growth rates of polynomial, exponential, and logarithmic functions.	EK 2.3D1	EK 2.3D1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Analyze the relationship between slope fields and solution curves for differential equations.	EK 2.3F1	EK 2.3F1
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Apply the Mean Value Theorem for definite integrals to find the average value of a function.	EK 2.4A1	EK 2.4A1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find position and acceleration from velocity or position and velocity from acceleration.	EK 3.1A1	EK 3.1A1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find specific antiderivatives using initial conditions.	EK 3.1B5	EK 3.1B5
Math	HS	Honors Calculus	Numbers and Operations	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Represent the definite integral as a limit of Riemann sums over equal subdivisions.	EK 3.2A1	EK 3.2A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use left, right, and midpoint Riemann sums to approximate definite integrals.	EK 3.2A2	EK 3.2A2
Math	HS	Honors Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Approximate definite integrals for functions represented by graphs and by tables of values.	EK 3.2B1	EK 3.2B1

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Math	HS	Honors Calculus	Numbers and Operations	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Represent the definite integral of the rate of change of a quantity over an interval as the net change of the quantity over the interval.	EK 3.2B2a	EK 3.2B2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use trapezoidal rule to approximate definite integrals.	EK 3.2B2b	EK 3.2B2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Compute Riemann sums using left, right, and midpoint evaluation points.	EK 3.2B2c	EK 3.2B2
Math	HS	Honors Calculus	Geometry	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Use geometric area formulas to evaluate definite integrals.	EK 3.2C1	EK 3.2C1
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Apply the properties of definite integrals, including order of integration, zero, constant mulitple, sum, and additivity.	EK 3.2C2	EK 3.2C2
Math	HS	Honors Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Define the definite integral as a number that represents the accumulated net signed area between a function and the x-axis over a specified interval.	EK 3.3A2a	EK 3.3A2
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find antiderivatives that follow directly from derivatives of basic functions.	EK 3.3A2b	EK 3.3A2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Perform analytic and graphical analysis of particular antiderivatives represented using the Fundamental Theorem of Calculus.	EK 3.3A3	EK 3.3A3
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use the Fundamental Theorem of Calculus to represent particular antiderivatives.	EK 3.3B2a	EK 3.3B2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use the Fundamental Theorem of Calculus to evaluate definite integrals.	EK 3.3B2b	EK 3.3B2
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use integration by substitution to find antiderivatives.	EK 3.3B5	EK 3.3B5
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find the area between curves.	EK 3.4D1	EK 3.4D1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find the volume of a solid region with known cross-sectional area.	EK 3.4D2a	EK 3.4D2
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find the volume of a solid of revolution by the disk, washer, or cylindrical shell method.	EK 3.4D2b	EK 3.4D2
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find work done when a variable force is applied to an object.	EK 3.4E1	EK 3.4E1
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Solve separable differential equations [f(y)dy=f(x)dx].	EK 3.5A2a	EK 3.5A2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use separable differential equations in modeling.	EK 3.5A2b	EK 3.5A2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Apply the differential equation y'=ky to exponential growth and decay.	EK 3.5B1	EK 3.5B1
Math	HS	Honors Calculus	Numbers and Operations	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Represent the limiting process verbally, analytically, graphically, and numerically.	EK 1.1A1	EK 1.1A1
Math	HS	Honors Calculus	Geometry	Locate points or describe relationships using the coordinate plane.	Use limits to define and test for continuity.	EK 1.1A1b	EK 1.1A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use graphs and tables to estimate one- and two-sided limits.	EK 1.1A2a	EK 1.1A2
Math	HS	Honors Calculus	Geometry	Locate points or describe relationships using the coordinate plane.	Describe asymptotic behavior in terms of limits involving infinity.	EK 1.1A2b	EK 1.1A2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use algebra to calculate one- and two-sided limits.	EK 1.1A2c	EK 1.1A2
Math	HS	Honors Calculus	Geometry	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Make connections between asymptotes and graphical behavior.	EK 1.2A3a	EK 1.2A3
Math	HS	Honors Calculus	Geometry	Identify and/or apply concepts of transformations or symmetry.	Determine points of nondifferentiability, and classify those points as corners, vertical tangents, cusps, or discontinuities.	EK 1.2A3b	EK 1.2A3
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use the Intermediate value theorem and the Extreme Value theorem to represent continuity geometrically.	EK 1.2B1a	EK 1.2B1

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Honors Calculus	Geometry	Locate points or describe relationships using the coordinate plane.	Use the Mean Value Theorem to connect the average rate of change of a function over an interval to the instantaneous rate of change of a function at a point.	EK 1.2B1b	EK 1.2B1
Math	HS	Honors Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Define the derivative as the slope (instantaneous rate of change) or a curve at a point.	EK 2.1A1a	EK 2.1A1
Math	HS	Honors Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Define instantaneous rate of change as the limit of average rate of change.	EK 2.1A1b	EK 2.1A1
Math	HS	Honors Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Define the derivative as the limit of the difference quotient.	EK 2.1A2	EK 2.1A2
Math	HS	Honors Calculus	Numbers and Operations	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Represent the derivative verbally, analytically, graphically, and numerically.	EK 2.1A5	EK 2.1A5
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find velocity and acceleration from position using analytic, numeric, and graphical methods.	EK 2.1C1	EK 2.1C1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find derivatives of trigonometric functions.	EK 2.1C2a	EK 2.1C2
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find derivatives of inverse functions.	EK 2.1C2b	EK 2.1C2
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find derivatives of logarithmic functions.	EK 2.1C2c	EK 2.1C2
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find derivatives using the power, sum, product, and quotient rules.	EK 2.1C3	EK 2.1C3
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find derivatives using the chain rule.	EK 2.1C4	EK 2.1C4
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find first and second derivatives using implicit differentiation.	EK 2.1C5a	EK 2.1C5
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Use implicit differentiation to find the derivative of the inverse of a function.	EK 2.1C5b	EK 2.1C5
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find higher order derivatives.	EK 2.1D1	EK 2.1D1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use the values of f' to represent the slopes of f.	EK 2.2A1a	EK 2.2A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use the values of f" to represent the concavity of f.	EK 2.2A1b	EK 2.2A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use f' and f" to determine when f is increasing or decreasing.	EK 2.2A1c	EK 2.2A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use f' and f" to determine the concavity of f.	EK 2.2A1d	EK 2.2A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use f" to determine the inflection points of f.	EK 2.2A1e	EK 2.2A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use f' to determine the critical points of f.	EK 2.2A1f	EK 2.2A1
Math	HS	Honors Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Distinguish between absolute and local extreme values.	EK 2.2A1g	EK 2.2A1
Math	HS	Honors Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Approximate rate of change from graphs and tables of values.	EK 2.2A2a	EK 2.2A2
Math	HS	Honors Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Approximate derivatives for functions represented by graphs and by tables of values.	EK 2.2A2b	EK 2.2A2
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use the graph of f to draw the graphs of f' and f" and vice versa.	EK 2.2A3a	EK 2.2A3
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Make connections between the corresponding characteristics of the graphs of f, f' and f".	EK 2.2A3b	EK 2.2A3
Math	HS	Honors Calculus	Numbers and Operations	Understand the meanings of operations, use operations, and understand how they relate to each other.	Describe the relationship between differentiability and continuity.	EK 2.2B2	EK 2.2B2
Math	HS	Honors Calculus	Numbers and Operations	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Represent the Mean Value Theorem verbally, analytically, and graphically.	EK 2.3B1a	EK 2.3B1

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Honors Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Find the slope (instantaneous rate of change) of a curve at a point.	EK 2.3B1b	EK 2.3B1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find the equation of a tangent or normal line to a curve at a point.	EK 2.3B1c	EK 2.3B1
Math	HS	Honors Calculus	Numbers and Operations	Compute accurately and fluently and make reasonable estimates.	Use local linear approximations to approximate values of functions.	EK 2.3B2	EK 2.3B2
Math	HS	Honors Calculus	Geometry	Locate points or describe relationships using the coordinate plane.	Graph velocity and acceleration from position and vice versa.	EK 2.3C1a	EK 2.3C1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Analyze particle motion along a line, including position, displacement, and total distance.	EK 2.3C1b	EK 2.3C1
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use related rates equations to determine rates of change of functions with respect to time.	EK 2.3C2	EK 2.3C2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Apply properties of derivatives to maximize and minimize quantities.	EK 2.3C3a	EK 2.3C3
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use algebraic and graphical methods to solve optimization problems in a variety of contexts.	EK 2.3C3b	EK 2.3C3
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Compare the growth rates of polynomial, exponential, and logarithmic functions.	EK 2.3D1	EK 2.3D1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Analyze the relationship between slope fields and solution curves for differential equations.	EK 2.3F1	EK 2.3F1
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Apply the Mean Value Theorem for definite integrals to find the average value of a function.	EK 2.4A1	EK 2.4A1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find position and acceleration from velocity or position and velocity from acceleration.	EK 3.1A1	EK 3.1A1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find specific antiderivatives using initial conditions.	EK 3.1B5	EK 3.1B5
Math	HS	Honors Calculus	Numbers and Operations	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Represent the definite integral as a limit of Riemann sums over equal subdivisions.	EK 3.2A1	EK 3.2A1
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use left, right, and midpoint Riemann sums to approximate definite integrals.	EK 3.2A2	EK 3.2A2
Math	HS	Honors Calculus	Algebraic Concepts	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	Approximate definite integrals for functions represented by graphs and by tables of values.	EK 3.2B1	EK 3.2B1
Math	HS	Honors Calculus	Numbers and Operations	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Represent the definite integral of the rate of change of a quantity over an interval as the net change of the quantity over the interval.	EK 3.2B2a	EK 3.2B2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use trapezoidal rule to approximate definite integrals.	EK 3.2B2b	EK 3.2B2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Compute Riemann sums using left, right, and midpoint evaluation points.	EK 3.2B2c	EK 3.2B2
Math	HS	Honors Calculus	Geometry	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Use geometric area formulas to evaluate definite integrals.	EK 3.2C1	EK 3.2C1
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Apply the properties of definite integrals, including order of integration, zero, constant mulitple, sum, and additivity.	EK 3.2C2	EK 3.2C2
Math	HS	Honors Calculus	Algebraic Concepts	Demonstrate and understanding of patterns, relations, and functions.	Define the definite integral as a number that represents the accumulated net signed area between a function and the x-axis over a specified interval.	EK 3.3A2a	EK 3.3A2
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find antiderivatives that follow directly from derivatives of basic functions.	EK 3.3A2b	EK 3.3A2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Perform analytic and graphical analysis of particular antiderivatives represented using the Fundamental Theorem of Calculus.	EK 3.3A3	EK 3.3A3
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use the Fundamental Theorem of Calculus to represent particular antiderivatives.	EK 3.3B2a	EK 3.3B2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use the Fundamental Theorem of Calculus to evaluate definite integrals.	EK 3.3B2b	EK 3.3B2

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Honors Calculus	Measurement	Apply appropriate techniques, tools, and formulas to determine measurements.	Use integration by substitution to find antiderivatives.	EK 3.3B5	EK 3.3B5
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find the area between curves.	EK 3.4D1	EK 3.4D1
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find the volume of a solid region with known cross-sectional area.	EK 3.4D2a	EK 3.4D2
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find the volume of a solid of revolution by the disk, washer, or cylindrical shell method.	EK 3.4D2b	EK 3.4D2
Math	HS	Honors Calculus	Algebraic Concepts	Analyze change in various contexts.	Find work done when a variable force is applied to an object.	EK 3.4E1	EK 3.4E1
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Solve separable differential equations [f(y)dy=f(x)dx].	EK 3.5A2a	EK 3.5A2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Use separable differential equations in modeling.	EK 3.5A2b	EK 3.5A2
Math	HS	Honors Calculus	Algebraic Concepts	Describe or use models to represent quantitative relationships.	Apply the differential equation y'=ky to exponential growth and decay.	EK 3.5B1	EK 3.5B1
Math	HS	Math Analysis & Discrete Math	Numbers and Operations	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Convert fractions to decimals.	CC.2.1.HS.F.1	
Math	HS	Math Analysis & Discrete Math	Geometry	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Use the language of graph theory, including graphs, vertices, edges, parallel edges, loops, and isolated vertices.	CC.2.3.HS.A.13A	
Math	HS	Math Analysis & Discrete Math	Geometry	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships	Finding the slope of a line of best fit	CC.2.3.HS.A.13B	
Math	HS	Math Analysis & Discrete Math	Geometry	Identify and/or apply concepts of transformations or symmetry.	Use the Geometric approach to linear programming.	CC.2.3.HS.A.2	
Math	High Shool	Math Analysis & Discrete Math	Geometry	Apply geometric concepts to model and solve real world problems.	create a scatter plot diagram	CC.2.3.HS.A.14	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Represent and/or analyze mathematical situations and structures using numbers, symbols, words, tables, and/or graphs.	Use the equation of a line to analyze data.	CC.2.2.HS.D.10A	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Represent and/or analyze mathematical situations and structures using numbers, symbols, words, tables, and/or graphs.	Write a prediction equation.	CC.2.2.HS.D.10B	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Represent and/or analyze mathematical situations and structures using numbers, symbols, words, tables, and/or graphs.	Find a break - even point.	CC.2.2.HS.D.10C	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Use reasoning to solve equations and justify the solution method	Find market price with a given supply and demand formula	CC.2.2.HS.D.9	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Represent and/or analyze mathematical situations and structures using numbers, symbols, words, tables, and/or graphs.	Analyze a mixture problem.	CC.2.2.HS.D.7	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Write expressions in equivalent forms to solve problems.	Find the principal, the amount of the loan, the rate of interest, and the time in years for a simple interest loan.	CC.2.2.HS.D.2A	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Write expressions in equivalent forms to solve problems.	Find the proceeds, the amount of the loan, the rate of interest, and the time in years for a discounted loan.	CC.2.2.HS.D.2B	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Write expressions in equivalent forms to solve problems.	Find the principal, the amount of the loan, the rate of interest, and the time in years for a compound interest loan.	CC.2.2.HS.D.2C	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Write expressions in equivalent forms to solve problems.	Compare compound rates of interest with simple interest to determine the effective yield of interest.	CC.2.2.HS.D.2D	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Write expressions in equivalent forms to solve problems.	Find the amount of an annuity.	CC.2.2.HS.D.2E	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Write expressions in equivalent forms to solve problems.	Find the payment required for a savings (sinking) fund.	CC.2.2.HS.D.2F	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Write expressions in equivalent forms to solve problems.	Find the present value of an annuity.	CC.2.2.HS.D.2G	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Write expressions in equivalent forms to solve problems.	Find the payment for an amortized loan.	CC.2.2.HS.D.2H	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Create and graph equations or inequalities to describe numbers in relationships.	Calculate the value of a stock	CC.2.2.HS.D.7A	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Create and graph equations or inequalities to describe numbers in relationships.	Compare stocks and bonds as long term investments.	CC.2.2.HS.D.7B	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Write expressions in equivalent forms to solve problems.	Compare leasing vs. buying of cars and mortgages	CC.2.2.HS.D.7A	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Write expressions in equivalent forms to solve problems.	Compare and contrast retirement options	CC.2.2.HS.D.7B	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Write expressions in equivalent forms to solve problems.	Finding inflation and the eroding power of money.	CC.2.2.HS.D.7C	
Math	HS	Math Analysis & Discrete Math	Algebraic Concepts	Write expressions in equivalent forms to solve problems.	Determine the value of school loan payments over given time	CC.2.2.HS.D.7D	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.	Distinguish between random samples and biased samples.	CC.2.4.HS.B.5A	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.	Distinguish between random samples and biased samples.	CC.2.4.HS.B.5B	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.	Use a histogram and a frequency polygon to represent grouped data in graphical form.	CC.2.4.HS.B.5C	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Summarize, represent, and interpret data on a single count or measurement variable.	Find mean, median, mode, and range for raw and grouped data.	CC.2.4.HS.B.1A	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Summarize, represent, and interpret data on a single count or measurement variable.	Find standard deviation for raw and grouped data.	CC.2.4.HS.B.1B	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Summarize, represent, and interpret data on a single count or measurement variable.	Recognize the properties of the standard normal curve.	CC.2.4.HS.B.1C	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Summarize, represent, and interpret data on a single count or measurement variable.	Use the standard normal curve to analyze data.	CC.2.4.HS.B.1	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	Use the language of set theory.	CC.2.4.HS.B.7A	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	Use Venn Diagrams and the addition rule to determine the number of elements in a set.	CC.2.4.HS.B.7B	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	Use the multiplication counting principle.	CC.2.4.HS.B.7C	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	Find the permutations of n objects taken r at a time, including permutations with repetition.	CC.2.4.HS.B.7D	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	Find the combinations of n objects taken r at a time, including combinations with separate cases.	CC.2.4.HS.B.7E	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	Determine the sample space of a real or conceptual experiment.	CC.2.4.HS.B.7F	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	Express the likelihood for or against an event in terms of probability and odds.	CC.2.4.HS.B.7G	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	FInding odds with given probabilities	CC.2.4.HS.B.6	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	Use counting techniques to determine probabilities.	CC.2.4.HS.B.7H	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	Find conditional probability of an event.	CC.2.4.HS.B.7I	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	Find the probability of independent events.	CC.2.4.HS.B.7J	
Math	HS	Math Analysis & Discrete Math	Data Analysis and Probability	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	Use Bayes' formula to determine probabilities.	CC.2.4.HS.B.7K	
Math	HS	Geometry	Properties of Circles, Spheres, and Cylinders	Circles	Identify and/or use parts of circles and segments associated with circles, spheres, and cylinders.	Identify, determine, and/or use the radius, diameter, segment, and/or tangent of a circle.	G.1.1.1.1
Math	HS	Geometry	Properties of Circles, Spheres, and Cylinders	Circles	Identify and/or use parts of circles and segments associated with circles, spheres, and cylinders.	Identify, determine, and/or use the arcs, semicircles, sectors, and/or angles of a circle.	G.1.1.1.2
Math	HS	Geometry	Properties of Circles, Spheres, and Cylinders	Circles	Identify and/or use parts of circles and segments associated with circles, spheres, and cylinders.	Use chords, tangents, and secants to find missing arc measures or missing segment measures.	G.1.1.1.3
Math	HS	Geometry	Properties of Circles, Spheres, and Cylinders	3D Shapes	Identify and/or use parts of circles and segments associated with circles, spheres, and cylinders.	Identify and/or use the properties of a sphere or cylinder.	G.1.1.1.4
Math	HS	Geometry	Properties of Circles, Spheres, and Cylinders	Circles	Identify and/or use parts of circles and segments associated with circles, spheres, and cylinders.	Apply geometric theorems to verify properties of circles.	CC.2.3.HS.A.8
Math	HS	Geometry	Properties of Circles, Spheres, and Cylinders	Circles	Identify and/or use parts of circles and segments associated with circles, spheres, and cylinders.	Extend the concept of similarity to determine arc lengths and areas of sectors of circles.	CC.2.3.HS.A.9
Math	HS	Geometry	Properties of Circles, Spheres, and Cylinders	3D Shapes	Identify and/or use parts of circles and segments associated with circles, spheres, and cylinders.	Analyze relationships between two-dimensional and three-dimensional objects.	CC.2.3.HS.A.13

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Geometry	Properties of Polygons and Polyhedra	Triangles	Recognize and/or apply properties of angles, polygons, and polyhedra.	Identify and/or use properties of triangles.	G.1.2.1.1
Math	HS	Geometry	Properties of Polygons and Polyhedra	Quadrilaterals	Recognize and/or apply properties of angles, polygons, and polyhedra.	Identify and/or use properties of quadrilaterals.	G.1.2.1.2
Math	HS	Geometry	Properties of Polygons and Polyhedra	Triangles	Recognize and/or apply properties of angles, polygons, and polyhedra.	Identify and/or use properties of isosceles and equilateral triangles.	G.1.2.1.3
Math	HS	Geometry	Properties of Polygons and Polyhedra	Polygons	Recognize and/or apply properties of angles, polygons, and polyhedra.	Identify and/or use properties of regular polygons.	G.1.2.1.4
Math	HS	Geometry	Properties of Polygons and Polyhedra	3D Shapes	Recognize and/or apply properties of angles, polygons, and polyhedra.	Identify and/or use properties of pyramids and prisms.	G.1.2.1.5
Math	HS	Geometry	Properties of Polygons and Polyhedra	Triangles	Recognize and/or apply properties of angles, polygons, and polyhedra.	Understand and apply congruence, similarity, and geometric transformations using various tools.	CC.2.3.8.A.2
Math	HS	Geometry	Properties of Polygons and Polyhedra	Angles	Recognize and/or apply properties of angles, polygons, and polyhedra.	Verify and apply geometric theorems as they relate to geometric figures.	CC.2.3.HS.A.3
Math	HS	Geometry	Properties of Polygons and Polyhedra	Quadrilaterals	Recognize and/or apply properties of angles, polygons, and polyhedra.	Verify and apply geometric theorems as they relate to geometric figures.	CC.2.3.HS.A.3
Math	HS	Geometry	Properties of Polygons and Polyhedra	Polygons	Recognize and/or apply properties of angles, polygons, and polyhedra.	Verify and apply geometric theorems as they relate to geometric figures.	CC.2.3.HS.A.3
Math	HS	Geometry	Properties of Polygons and Polyhedra	Polygons	Recognize and/or apply properties of angles, polygons, and polyhedra.	Analyze relationships between two-dimensional and three-dimensional objects.	CC.2.3.HS.A.13
Math	HS	Geometry	Congruence, Similarity, and Proofs	Polygons	Use properties of congruence, correspondence, and similarity in problem-solving settings involving two-and three-dimensional figures.	Identify and/or use properties of congruent and similar polygons or solids.	G.1.3.1.1
Math	HS	Geometry	Congruence, Similarity, and Proofs	Proof	Use properties of congruence, correspondence, and similarity in problem-solving settings involving two-and three-dimensional figures.	Identify and/or use properties of congruent and similar polygons or solids.	G.1.3.1.1

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Geometry	Congruence, Similarity, and Proofs	Similarity	Use properties of congruence, correspondence, and similarity in problem-solving settings involving two-and three-dimensional figures.	Identify and/or use proportional relationships in similar figures.	G.1.3.1.2
Math	HS	Geometry	Congruence, Similarity, and Proofs	Triangles	Use properties of congruence, correspondence, and similarity in problem-solving settings involving two-and three-dimensional figures.	Use geometric figures and their properties to represent transformations in the plane.	CC.2.3.HS.A.1
Math	HS	Geometry	Congruence, Similarity, and Proofs	Proof	Use properties of congruence, correspondence, and similarity in problem-solving settings involving two-and three-dimensional figures.	Use geometric figures and their properties to represent transformations in the plane.	CC.2.3.HS.A.1
Math	HS	Geometry	Congruence, Similarity, and Proofs	Triangles	Use properties of congruence, correspondence, and similarity in problem-solving settings involving two-and three-dimensional figures.	Apply rigid transformations to determine and explain congruence.	CC.2.3.HS.A.2
Math	HS	Geometry	Congruence, Similarity, and Proofs	Proof	Use properties of congruence, correspondence, and similarity in problem-solving settings involving two-and three-dimensional figures.	Apply rigid transformations to determine and explain congruence.	CC.2.3.HS.A.2
Math	HS	Geometry	Congruence, Similarity, and Proofs	Triangles	Use properties of congruence, correspondence, and similarity in problem-solving settings involving two-and three-dimensional figures.	Create justifications based on transformations to establish similarity of plane figures.	CC.2.3.HS.A.5
Math	HS	Geometry	Congruence, Similarity, and Proofs	Proof	Use properties of congruence, correspondence, and similarity in problem-solving settings involving two-and three-dimensional figures.	Create justifications based on transformations to establish similarity of plane figures.	CC.2.3.HS.A.5
Math	HS	Geometry	Congruence, Similarity, and Proofs	Similarity	Use properties of congruence, correspondence, and similarity in problem-solving settings involving two-and three-dimensional figures.	Verify and apply theorems involving similarity as they relate to plane figures.	CC.2.3.HS.A.6
Math	HS	Geometry	Congruence, Similarity, and Proofs	Proof	Use properties of congruence, correspondence, and similarity in problem-solving settings involving two-and three-dimensional figures.	Verify and apply theorems involving similarity as they relate to plane figures.	CC.2.3.HS.A.6
Math	HS	Geometry	Congruence, Similarity, and Proofs	Proof	Write formal proofs and/or use logic statements to construct or validate arguments.	Write, analyze, complete, or identify formal proofs (e.g., direct and/or indirect proofs/proofs by contradiction).	G.1.3.2.1

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Geometry	Congruence, Similarity, and Proofs	Trigonometry	Write formal proofs and/or use logic statements to construct or validate arguments.	Prove the Pythagorean identity and use it to calculate trigonometric ratios.	CC.2.2.HS.C.9
Math	HS	Geometry	Congruence, Similarity, and Proofs	Proof	Write formal proofs and/or use logic statements to construct or validate arguments.	Verify and apply geometric theorems as they relate to geometric figures.	CC.2.3.HS.A.3
Math	HS	Geometry	Congruence, Similarity, and Proofs	Proof	Write formal proofs and/or use logic statements to construct or validate arguments.	Verify and apply theorems involving similarity as they relate to plane figures.	CC.2.3.HS.A.6
Math	HS	Geometry	Congruence, Similarity, and Proofs	Circles	Write formal proofs and/or use logic statements to construct or validate arguments.	Apply geometric theorems to verify properties of circles.	CC.2.3.HS.A.8
Math	HS	Geometry	Coordinate Geometry and Right Triangles	Triangles	Solve problems involving right triangles.	Use the Pythagorean theorem to write and/or solve problems involving right triangles.	G.2.1.1.1
Math	HS	Geometry	Coordinate Geometry and Right Triangles	Triangles	Solve problems involving right triangles.	Use trigonometric ratios to write and/or solve problems involving right triangles.	G.2.1.1.2
Math	HS	Geometry	Coordinate Geometry and Right Triangles	Trigonometry	Solve problems involving right triangles.	Prove the Pythagorean identity and use it to calculate trigonometric ratios.	CC.2.2.HS.C.9
Math	HS	Geometry	Coordinate Geometry and Right Triangles	Trigonometry	Solve problems involving right triangles.	Apply trigonometric ratios to solve problems involving right triangles.	CC.2.3.HS.A.7
Math	HS	Geometry	Coordinate Geometry and Right Triangles	Triangles	Solve problems using analytic geometry.	Calculate the distance and/or midpoint between two points on a number line or on a coordinate plane.	G.2.1.2.1
Math	HS	Geometry	Coordinate Geometry and Right Triangles	Triangles	Solve problems using analytic geometry.	Relate slope to perpendicularity and/or parallelism (limit to linear algebraic equations).	G.2.1.2.2

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Geometry	Coordinate Geometry and Right Triangles	Triangles	Solve problems using analytic geometry.	Use slope, distance, and/or midpoint between two points on a coordinate plane to establish properties of a two dimensional shape.	G.2.1.2.3
Math	HS	Geometry	Coordinate Geometry and Right Triangles	Triangles	Solve problems using analytic geometry.	Understand and apply the Pythagorean theorem to solve problems.	CC.2.3.8.A.3
Math	HS	Geometry	Coordinate Geometry and Right Triangles	Proof	Solve problems using analytic geometry.	Apply coordinate geometry to prove simple geometric theorems algebraically.	CC.2.3.HS.A.11
Math	HS	Geometry	Coordinate Geometry and Right Triangles	Quadrilaterals	Solve problems using analytic geometry.	Apply coordinate geometry to prove simple geometric theorems algebraically.	CC.2.3.HS.A.11
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Angles	Use and/or compare measurements of angles.	Use properties of angles formed by intersecting lines to find the measures of missing angles	G.2.2.1.1
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Angles	Use and/or compare measurements of angles.	Use properties of angles formed when two parallel lines are cut by a transversal to find the measures of missing angles.	G.2.2.1.2
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Similarity	Use and/or compare measurements of angles.	Understand and apply congruence, similarity, and geometric transformations using various tools.	CC.2.3.8.A.2
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Angles	Use and/or compare measurements of angles.	Verify and apply geometric theorems as they relate to geometric figures	CC.2.3.HS.A.3
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Polygons	Use and/or develop procedures to determine or describe measures of perimeter, circumference, and/or area. (May require conversions within the same system.)	Estimate area, perimeter, or circumference of an irregular figure.	G.2.2.2.1

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Polygons	Use and/or develop procedures to determine or describe measures of perimeter, circumference, and/or area. (May require conversions within the same system.)	Find the measurement of a missing length, given the perimeter, circumference, or area.	G.2.2.2.2
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Polygons	Use and/or develop procedures to determine or describe measures of perimeter, circumference, and/or area. (May require conversions within the same system.)	Find the side lengths of a polygon with a given perimeter to maximize the area of the polygon.	G.2.2.2.3
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Polygons	Use and/or develop procedures to determine or describe measures of perimeter, circumference, and/or area. (May require conversions within the same system.)	Develop and/or use strategies to estimate the area of a compound/composite figure.	G.2.2.2.4
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Circles	Use and/or develop procedures to determine or describe measures of perimeter, circumference, and/or area. (May require conversions within the same system.)	Find the area of a sector of a circle.	G.2.2.2.5
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Polygons	Use and/or develop procedures to determine or describe measures of perimeter, circumference, and/or area. (May require conversions within the same system.)	Use the concept and notation of functions to interpret and apply them in terms of their context.	G.2.2.2.5
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Polygons	Use and/or develop procedures to determine or describe measures of perimeter, circumference, and/or area. (May require conversions within the same system.)	Verify and apply geometric theorems as they relate to geometric figures.	CC.2.3.HS.A.3
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Circles	Use and/or develop procedures to determine or describe measures of perimeter, circumference, and/or area. (May require conversions within the same system.)	Extend the concept of similarity to determine arc lengths and areas of sectors of circles.	CC.2.3.HS.A.9
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Circles	Use and/or develop procedures to determine or describe measures of perimeter, circumference, and/or area. (May require conversions within the same system.)	Describe how a change in the linear dimension of a figure affects its perimeter, circumference, and area (e.g., How does changing the length of the radius of a circle affect the circumference of the circle?).	G.2.2.3.1
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Circles	Use and/or develop procedures to determine or describe measures of perimeter, circumference, and/or area. (May require conversions within the same system.)	Apply geometric theorems to verify properties of circles.	CC.2.3.HS.A.8

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Circles	Use and/or develop procedures to determine or describe measures of perimeter, circumference, and/or area. (May require conversions within the same system.)	Extend the concept of similarity to determine arc lengths and areas of sectors of circles.	CC.2.3.HS.A.9
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Probability	Apply probability to practical situations.	Use area models to find probabilities.	G.2.2.4.1
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	Probability	Apply probability to practical situations.	Apply geometric concepts to model and solve real-world problems.	CC.2.3.HS.A.14
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	3D Shapes	Use and/or develop procedures to determine or describe measures of surface area and/or volume. (May require conversions within the same system.)	Calculate the surface area of prisms, cylinders, cones, pyramids, and/or spheres. Formulas are provided on a reference sheet.	G.2.3.1.1
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	3D Shapes	Use and/or develop procedures to determine or describe measures of surface area and/or volume. (May require conversions within the same system.)	Calculate the volume of prisms, cylinders, cones, pyramids, and/or spheres. Formulas are provided on a reference sheet.	G.2.3.1.2
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	3D Shapes	Use and/or develop procedures to determine or describe measures of surface area and/or volume. (May require conversions within the same system.)	Find the measurement of a missing length given the surface area or volume.	G.2.3.1.3
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	3D Shapes	Use and/or develop procedures to determine or describe measures of surface area and/or volume. (May require conversions within the same system.)	Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems.	CC.2.3.8.A.1
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	3D Shapes	Use and/or develop procedures to determine or describe measures of surface area and/or volume. (May require conversions within the same system.)	Explain volume formulas and use them to solve problems.	CC.2.3.HS.A.12
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	3D Shapes	Use and/or develop procedures to determine or describe measures of surface area and/or volume. (May require conversions within the same system.)	Apply geometric concepts to model and solve real world problems.	CC.2.3.HS.A.14

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	3D Shapes	Use and/or develop procedures to determine or describe measures of surface area and/or volume. (May require conversions within the same system.)	Describe how a change in the linear dimension of a figure affects its surface area or volume (e.g., How does changing the length of the edge of a cube affect the volume of the cube?).	G.2.3.2.1
Math	HS	Geometry	Measurements of Two Dimensional Shapes and Figures	3D Shapes	Use and/or develop procedures to determine or describe measures of surface area and/or volume. (May require conversions within the same system.)	Analyze relationships between two-dimensional and three-dimensional objects.	CC.2.3.HS.A.13
Math	HS	Geometry	Functions	Algebra Skills	Interpret and/or use linear functions and their equations, graphs, or tables	Understand the connections between proportional relationships, lines, and linear equations	CC.2.2.8.B.2
Math	HS	Geometry	Coordinate Geometry	Algebra Skills	Describe, compute, and/or use the rate of change (slope) of a line.	Write or identify a linear equation when given the graph of the line, two points on the line, or the slope and a point on the line. Note: Linear equation may be in point-slope, standard, and/or slope-intercept form.	A1.2.2.1.3
Math	HS	Geometry	Linear Equations	Algebra Skills	Write, solve, and/or graph systems of linear equations using various methods.	Analyze and solve linear equations and pairs of simultaneous linear equations.	CC.2.2.8.B.3
Math	HS	Geometry	Coordinate Geometry	Algebra Skills	Describe, compute, and/or use the rate of change (slope) of a line.	Graph and analyze functions and use their properties to make connections between the different representations.	CC.2.2.HS.C.2
Math	HS	Geometry	Operations with Real Numbers and Expressions	Algebra Skills	Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, and exponents).	Simplify square roots (e.g., √24 = 2√6).	A1.1.1.1.2

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Geometry	Non-Linear Equations	Algebra Skills	Write and/or solve non-linear equations using various methods.	Write and/or solve quadratic equations (including factoring and using the Quadratic Formula).	A2.1.3.1.1
Math	HS	Geometry	Non-Linear Expressions	Algebra Skills	Simplify expressions involving polynomials.	Understand the relationship between zeros and factors of polynomials to make generalizations about functions and their graphs.	CC.2.2.HS.D.4
Math	HS	Integrated Algebra II/ Statistics	Unit 1 Skills Review & Simplifying Expressions	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Estimate the value of irrational numbers without a calculator (limit whole number radicand to less than 144). Example: √5 is between 2 and 3 but closer to 2.	M08.A-N.1.1.3	
Math	HS	Integrated Algebra II/ Statistics	Unit 1 Skills Review & Simplifying Expressions		Locate/identify rational and irrational numbers at their approximate locations on a number line.	M08.A-N.1.1.5	
Math	HS	Integrated Algebra II/ Statistics	Unit 1 Skills Review & Simplifying Expressions		Use rational approximations of irrational numbers to compare and order irrational numbers.	M08.A-N.1.1.4	
Math	HS	Integrated Algebra II/ Statistics	Unit 1 Skills Review & Simplifying Expressions		Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Express answers in scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology (e.g., interpret 4.7EE9 displayed on a calculator as 4.7 × 10^9).	M08.B-E.1.1.4	
Math	HS	Integrated Algebra II/ Statistics	Unit 1 Skills Review & Simplifying Expressions		Compare and/or order any real numbers (rational and irrational may be mixed).	A1.1.1.1.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 1 Skills Review & Simplifying Expressions		Simplify square roots	A1.1.1.1.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 1 Skills Review & Simplifying Expressions		Find the Greatest Common Factor (GCF) and/or the Least Common Multiple (LCM) for sets of monomials.	A1.1.1.2.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 1 Skills Review & Simplifying Expressions		Simplify/evaluate expressions involving properties/laws of exponents, roots and/or absolute value to solve problems (exponents should be integers from -10 to 10).	A1.1.1.3.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 1 Skills Review & Simplifying Expressions		Use exponential expressions to represent rational numbers.	A2.1.2.1.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 1 Skills Review & Simplifying Expressions		Simplify/evaluate expressions involving positive and negative exponents and/or roots (may contain all types of real numbers - exponents should not exceed power of 10).	A2.1.2.1.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 1 Skills Review & Simplifying Expressions		Simplify rational algebraic expressions	A2.1.2.2.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 2 - Solving Linear Equations and Inequalities		Write, solve and/or apply a linear equation (including problem situations)	A1.1.2.1.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 2 - Solving Linear Equations and Inequalities		Write or solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities).	A1.1.3.1.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 2 - Solving Linear Equations and Inequalities		Identify or graph the solution set to a linear inequality on a number line	A1.1.3.1.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 2 - Solving Linear Equations and Inequalities		Write and/or solve a system of linear inequalities using graphing (limit systems to 2 linear inequalities)	A1.1.3.2.1	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Integrated Algebra II/ Statistics	Unit 2 - Solving Linear Equations and Inequalities		Use exponents, roots and/or absolute values to represent equivalent forms or to solve problems.	A2.1.2.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 2 - Solving Linear Equations and Inequalities		Use algebraic processes to solve a formula for a given variable	A2.1.3.2.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 3 - Graphing Linear Equations and Inequalities		Use the concept and notation of functions to interpret and apply them in terms of their context	CC.2.2.HS.C.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 3 - Graphing Linear Equations and Inequalities		Write and/or solve a system of linear inequalities using graphing (limit systems to 2 linear inequalities)	A1.1.3.2.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 3 - Graphing Linear Equations and Inequalities		Determine if a relation is a function given a set of points or a graph	A1.2.1.1.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 3 - Graphing Linear Equations and Inequalities		Translate from one representation of a linear function to another (graph, table and equation)	A1.2.1.2.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 3 - Graphing Linear Equations and Inequalities		Determine the slope and/or y-intercept represented by a linear equation or graph	A1.2.2.1.4	
Math	HS	Integrated Algebra II/ Statistics	Unit 3 - Graphing Linear Equations and Inequalities		Draw, find and/or write an equation for a line of best fit for a scatter plot	A1.2.2.2.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 3 - Graphing Linear Equations and Inequalities		Determine the domain, range or inverse of a relation	A2.2.1.1.3	
Math	HS	Integrated Algebra II/ Statistics	Unit 3 - Graphing Linear Equations and Inequalities		Draw, identify, find and/or write an equation for a regression model (lines and curves of best fit) for a scatter plot.	A2.2.3.1.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 3 - Graphing Linear Equations and Inequalities		Make predictions using the equations or graphs of regression models (lines and curves of best fit) of scatter plots.	A2.2.3.1.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 4 - Systems of Equaitons & Inequalities		Write and/or solve a system of linear equations (including problem situations) using graphing, substitution and/or elimination (limit systems to 2 linear equations).	A1.1.2.2.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 4 - Systems of Equaitons & Inequalities		Write and/or solve a system of linear inequalities using graphing (limit systems to 2 linear inequalities)	A1.1.3.2.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 5 - Exponential Funcitons & Expressions		Simplify/evaluate expressions involving positive and negative exponents and/or roots (may contain all types of real numbers - exponents should not exceed power of 10).	A2.1.2.1.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 5 - Exponential Funcitons & Expressions		Simplify/evaluate expressions involving multiplying with exponents, powers of powers and powers of products (limit to rational exponents).	A2.1.2.1.3	
Math	HS	Integrated Algebra II/ Statistics	Unit 5 - Exponential Funcitons & Expressions		Write, solve and/or apply linear or exponential growth or decay (including problem situations)	A2.1.3.1.4	
Math	HS	Integrated Algebra II/ Statistics	Unit 5 - Exponential Funcitons & Expressions		Determine the domain, range or inverse of a relation	A2.2.1.1.3	
Math	HS	Integrated Algebra II/ Statistics	Unit 6 - Quadratic Functions		Write and/or solve quadratic equations (including factoring and using the Quadratic Formula	A2.1.3.1.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 6 - Quadratic Functions		Solve equations involving rational and/or radical expressions	A2.1.3.1.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 6 - Quadratic Functions		Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increasing/decreasing, intercepts, zeros, and asymptotes)	A2.2.1.1.4	
Math	HS	Integrated Algebra II/ Statistics	Unit 6 - Quadratic Functions		Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function.	A2.2.2.1.3	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Integrated Algebra II/ Statistics	Unit 7 - Intro to Probability and Statisitics		Calculate and/or interpret the range, quartiles and interquartile range of data.	A1.2.3.1.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 7 - Intro to Probability and Statisitics		Estimate or calculate to make predictions based on a circle, line, bar graph, measures of central tendency, or other representations.	A1.2.3.2.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 7 - Intro to Probability and Statisitics		Analyze data, make predictions, and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots, scatter plots, measures of central tendency, or other representations).	A1.2.3.2.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 7 - Intro to Probability and Statisitics		Find probabilities for compound events (e.g., find probability of red and blue, find probability of red or blue) and represent as a fraction, decimal or percent).	A1.2.3.3.1	
Math	HS	Integrated Algebra II/ Statistics	Unit 7 - Intro to Probability and Statisitics		Use odds to find probability and/or use probability to find odds	A2.2.3.2.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 7 - Intro to Probability and Statisitics		Use probability for independent, dependent or compound events to predict outcomes	A2.2.3.2.3	
Math	HS	Integrated Algebra II/ Statistics	Unit 8 - Matrices		Write expressions in equivalent forms to solve problems.	CC.2.2.HS.D.2	
Math	HS	Integrated Algebra II/ Statistics	Unit 8 - Matrices		Add, subtract, and multiply matrices.	CYMAAL2H.D.2.14	
Math	HS	Trigonometry/Advanced Math	Prerequisite Skills (0)	Understand the meanings of operations, use operations, and how they relate to one another.	Simplify radical expressions	CC.2.1.HS.F.1	
Math	HS	Honors Trigonometry/Precalculus	Prerequisite Skills (0)	Understand the meanings of operations, use operations, and how they relate to one another.	Simplify and perform operations on rational expressions.	CC.2.1.HS.F.2	
Math	HS	Trigonometry/Advanced Math	Introduction to Trigonometric Conceps (1)	Demonstrate an understanding of patterns, relations, and functions.	Evaluate trigonometric and inverse trigonometric expressions, using technology when appropriate.	CC.2.2.HS.C.7a	
Math	HS	Trigonometry/Advanced Math	Introduction to Trigonometric Concepts (1)	Apply appropriate techniques, tools, and formulas to determine measurements.	Convert from degrees to radians and visa versa.	CC.2.2.HS.C.7b	
Math	HS	Trigonometry/Advanced Math	Introduction to Trigonometric Concepts (1)	Apply appropriate techniques, tools, and formulas to determine measurements.	Convert from decimal degrees to degrees, minutes, seconds and visa versa.	CYMATR.B.2.02	
Math	HS	Trigonometry/Advanced Math	Introduction to Trigonometric Concepts (1)	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Identify and/or use properties of triangles to determine side lengths, specifically using special right triangles.	CYMATR.C.1.01	
Math	HS	Trigonometry/Advanced Math	Introduction to Trigonometric Concepts (1)	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Use trigonometric relationships to determine lengths and angle measures.	CC.2.3.HS.A.7	
Math	HS	Trigonometry/Advanced Math	Introduction to Trigonometric Concepts (1)	Locate points or describe relationships using the coordinate plane.	Given an angle of rotation, determine in which quadrant the angle lies.	CYMATR.C.3.01	
Math	HS	Trigonometry/Advanced Math	Graphing Trigonometric Functions (2)	Identify and/or apply concepts of transformations or symmetry.	Find symmetry with respect to the x- and y- axes and the origin.	CYMATR.C.2.02	
Math	HS	Trigonometry/Advanced Math	Graphing Trigonometric Functions (2)	Demonstrate an understanding of patterns, relations, and functions.	Use amplitude, period, and phase shift to graph trigonometric functions, including technology when appropriate.	CC.2.2.HS.C.8	
			Algebra Skills for Trigonometric Identities (3)	Understand the meanings of operations, use operations, and how they relate to one another.	Simplify and perform operations on rational expressions	CC.2.1.HS.F.2	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
			Algebra Skills for Trigonometric Identities (3)	Understand the meanings of operations, use operations, and how they relate to one another.	Add, subtract, multiply, and divide complex numbers in standard form.	CC.2.1.HS.F.6.B	
			Trigonometric Identities and Equations (4)	Demonstrate an understanding of patterns, relations, and functions.	Apply sum and difference, double-angle, and half-angle identities for sine and cosine.	CYMATR.D.1.10	
Math	HS	Trigonometry/Advanced Math	Trigonometric Identities and Equations (4)	Demonstrate an understanding of patterns, relations, and functions.	Verify trigonometric identities.	CYMATR.D.1.11	
Math	HS	Trigonometry/Advanced Math	Trigonometric Identities and Equations (4)	Represent and/or analyze mathematical situations and structures using numbers, symbols, words, tables, and/or graphs.	Solve trigonometric equations, using technology when appropriate.	CYMATR.D.2.03	
Math	HS	Trigonometry/Advanced Math	Polar Equations and Graphs (5)	Locate points or describe relationships using the coordinate plane.	Graph polar equations.	CYMATR.C.3.02	
Math	HS	Trigonometry/Advanced Math	Polar Equations and Graphs (5)	Locate points or describe relationships using the coordinate plane.	Convert rectangular coordinates to polar coordinates and visa versa.	CYMATR.C.3.03	
Math	HS	Trigonometry/Advanced Math	Polar Equations and Graphs (5)	Locate points or describe relationships using the coordinate plane.	Convert rectangular equations to polar equations and visa versa.	CYMATR.C.3.04	
Math	HS	Honors Trigonometry/Precalculus	Polar Equations and Graphs(5)	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Represent complex numbers in polar form.	CC.2.1.HS.F.6.A	
Math	HS	Honors Trigonometry/Precalculus	Polar Equations and Graphs (5)	Compute accurately and fluently and make reasonable estimates.	Multiply, divide, and find powers and roots of complex numbers in polar form.	CC.2.1.HS.F.6.C	
Math	HS	Trigonometry/Advanced Math	Solving Triangles and Areas of Triangles (6)	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Use concepts of trigonometry to find the area of oblique triangles.	CC.2.4.HS.A.14B	
			Solving Triangles and Areas of Triangles (6)	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Use the law of sines and the law of cosines to solve oblique triangles	CC.2.4.HS.A.14A	
			Conic Sections (7)	Locate points or describe relationships using the coordinate plane.	Identify properties of the conic sections, including circle, parabolas, ellipses, and hyperbolas.	CC.2.3.HS.A.10A	
			Conic Sections (7)	Locate points or describe relationships using the coordinate plane.	Graph circles, parabolas, ellipses, and hyperbolas, using technology when appropriate.	CC.2.3.HS.A.10B	
			Exponential, Logistic, and Logarithmic Functions (8)	Represent and/or analyze mathematical situations and structures using numbers, symbols, words, tables, and/or graphs.	Convert from exponential to logarithmic form and vice versa.	CC.2.2.HS.D.8A	A2.1.3.1.3
			Exponential, Logistic, and Logarithmic Functions (8)	Represent and/or analyze mathematical situations and structures using numbers, symbols, words, tables, and/or graphs.	Use properties of logarithms to rewrite expressions and to solve exponential and logarithmic equations	CC.2.2.HS.D.8B	A2.1.3.1.3
			Exponential, Logistic, and Logarithmic Functions (8)	Demonstrate an understanding of patterns, relations, and functions.	Evaluate exponential and logarithmic expressions, using technology when appropriate.	CC.2.2.HS.D.8C	
			Exponential, Logistic, and Logarithmic Functions (8)	Demonstrate an understanding of patterns, relations, and functions.	Perform transformations by composition, including polynomial, exponential, logarithmic, and trigonometric functions.	CC.2.2.HS.C.2B	
			Exponential, Logistic, and Logarithmic Functions (8)	Demonstrate an understanding of patterns, relations, and functions.	Perform transformations by finding inverses, including polynomial, exponential, logarithmic, and trigonometric functions.	CC.2.2.HS.C.4B	
			Exponential, Logistic, and Logarithmic Functions (8)	Demonstrate an understanding of patterns, relations, and functions.	Graph logarithmic and exponential functions using technology when appropriate.	CC.2.2.HS.C.2C	
Math	HS	Trigonometry/Advanced Math	Sequences and Series (9)	Demonstrate an understanding of patterns, relations, and functions.	Write formulas for arithmetic and geometric sequences explicitly and recursively.	CC.2.2.HS.C.3A	A2.2.1.1.2

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Trigonometry/Advanced Math	Sequences and Series (9)	Demonstrate an understanding of patterns, relations, and functions.	Find terms in arithmetic and geometric sequences.	CC.2.2.HS.C.2D	A2.2.1.1.2
Math	HS	Trigonometry/Advanced Math	Sequences and Series (9)	Demonstrate an understanding of patterns, relations, and functions.	Write formulas for arithmetic and geometric series using sigma notation and expanded form.	CC.2.2.HS.C.3B	A2.2.1.1.2
Math	HS	Trigonometry/Advanced Math	Sequences and Series (9)	Demonstrate an understanding of patterns, relations, and functions.	Find sums of arithmetic and geometric series.	CC.2.2.HS.C.2E	A2.2.1.1.2
Math	HS	Honors Trigonometry/Precalculus	Prerequisites (0)	Understand the meanings of operations, use operations, and how they relate to one another.	Simplify nth roots.	CC.2.1.HS.F.1	
Math	HS	Honors Trigonometry/Precalculus	Prerequisites (0)	Compute accurately and fluently and make reasonable estimates.	Add, subtract, multiply, and divide complex numbers in standard form.	CC.2.1.HS.F.6.B	
Math	HS	Honors Trigonometry/Precalculus	Functions and Graphs (1)	Demonstrate an understanding of patterns, relations, and functions.	Determine if a relation is a function given a set of points or a graph.	CC.2.2.HS.C.2A	
Math	HS	Honors Trigonometry/Precalculus	Functions and Graphs (1)	Demonstrate an understanding of patterns, relations, and functions.	Perform transformations by arithmetically combining expressions.	CC.2.2.HS.D.3	
Math	HS	Honors Trigonometry/Precalculus	Functions and Graphs (1)	Demonstrate an understanding of patterns, relations, and functions.	Perform transformations by composition, including polynomial, exponential, logarithmic, and trigonometric functions.	CC.2.2.HS.C.2B	
Math	HS	Honors Trigonometry/Precalculus	Functions and Graphs (1)	Demonstrate an understanding of patterns, relations, and functions.	Perform transformations by finding inverses, including polynomial, exponential, logarithmic, and trigonometric functions.	CC.2.2.HS.C.4B	
Math	HS	Honors Trigonometry/Precalculus	Functions and Graphs (1)	Demonstrate an understanding of patterns, relations, and functions.	Analyze/investigate functions (domain, range, intercepts, increasing, decreasing, constant, relative and absolute extrema, symmetry, asymptotes)	CC.2.2.HS.C.2F	A2.2.1.1.4
Math	HS	Honors Trigonometry/Precalculus	Functions and Graphs (1)	Identify and/or apply concepts of transformations or symmetry.	Find symmetry with respect to the x- and y- axes and the origin.	CYMATRPC.C.2.02	
Math	HS	Honors Trigonometry/Precalculus	Functions and Graphs (1)	Demonstrate an understanding of patterns, relations, and functions.	Determine end behavior of functions.	CC.2.2.HS.C.2G	
Math	HS	Honors Trigonometry/Precalculus	Functions and Graphs (1)	Identify and/or apply concepts of transformations or symmetry.	Use rigid and non-rigid transformations in graphing.	CC.2.2.HS.C.4A	
Math	HS	Honors Trigonometry/Precalculus	Introduction to Trigonometric Concepts (2)	Apply appropriate techniques, tools, and formulas to determine measurements.	Convert from degrees to radians and visa versa.	CC.2.2.HS.C.7	
Math	HS	Honors Trigonometry/Precalculus	Introduction to Trigonometric Concepts (2)	Apply appropriate techniques, tools, and formulas to determine measurements.	Convert from decimal degrees to degrees, minutes, seconds and visa versa.	CYMATRPC.B.2.02	
Math	HS	Honors Trigonometry/Precalculus	Introduction to Trigonometric Concepts (2)	Locate points or describe relationships using the coordinate plane.	Given an angle of rotation, determine in which quadrant the angle lies.	CYMATRPC.C.3.01	
Math	HS	Honors Trigonometry/Precalculus	Introduction to Trigonometric Concepts (2)	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Use trigonometric relationships to determine lengths and angle measures.	CC.2.3.HS.A.7	
Math	HS	Honors Trigonometry/Precalculus	Introduction to Trigonometric Concepts (2)	Demonstrate an understanding of patterns, relations, and functions.	Evaluate trigonometric and inverse trigonometric expressions, using technology when appropriate.	CC.2.2.HS.C.7	
Math	HS	Trigonometry/Advanced Math	Introduction to Trigonometric Concepts (1)	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Identify and/or use properties of triangles to determine side lengths, specifically using special right triangles.	CYMATR.C.1.01	
Math	HS	Honors Trigonometry/Precalculus					
			Graphing Trigonometric Functions (3)	Demonstrate an understanding of patterns, relations, and functions.	Evaluate trigonometric and inverse trigonometric expressions, using technology when appropriate.	CC.2.2.HS.C.7	
Math	HS	Honors Trigonometry/Precalculus	Graphing Trigonometric Functions (3)	Demonstrate an understanding of patterns, relations, and functions.	Perform transformations by composition, including polynomial, exponential, logarithmic, and trigonometric functions.	CC.2.2.HS.C.2B	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Honors Trigonometry/Precalculus	Graphing Trigonometric Functions (3)	Demonstrate an understanding of patterns, relations, and functions.	Perform transformations by finding inverses, including polynomial, exponential, logarithmic, and trigonometric functions.	CC.2.2.HS.C.4B	
Math	HS	Honors Trigonometry/Precalculus	Graphing Trigonometric Functions (3)	Demonstrate an understanding of patterns, relations, and functions.	Use amplitude, period, and phase shift to graph trigonometric functions, including technology when appropriate.	CC.2.2.HS.C.8	
Math	HS	Honors Trigonometry/Precalculus	Solving Triangles and Areas of Triangles (4)	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Use the law of sines and the law of cosines to solve oblique triangles.	CC.2.4.HS.A.14A	
Math	HS	Honors Trigonometry/Precalculus	Solving Triangles and Areas of Triangles (4)	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	Use concepts of trigonometry to find the area of non-right triangles.	CC.2.4.HS.A.14B	
Math	HS	Honors Trigonometry/Precalculus	Power, Polynomial, and Rational Functions (5)	Understand the meanings of operations, use operations, and how they relate to one another.	Simplify and perform operations on rational expressions.	CC.2.1.HS.F.2	
Math	HS	Honors Trigonometry/Precalculus	Power, Polynomial, and Rational Functions (5)	Demonstrate an understanding of patterns, relations, and functions.	Perform transformations by composition, including polynomial, exponential, logarithmic, and trigonometric functions.	CC.2.2.HS.C.2B	
Math	HS	Honors Trigonometry/Precalculus	Power, Polynomial, and Rational Functions (5)	Demonstrate an understanding of patterns, relations, and functions.	Find zeros of polynomials using the remainder theorem, factor theorem, and rational zeroes theorem.	CC.2.2.HS.D.4A	
Math	HS	Honors Trigonometry/Precalculus	Power, Polynomial, and Rational Functions (5)	Demonstrate an understanding of patterns, relations, and functions.	Write polynomials given specific zeroes.	CC.2.2.HS.D.4B	
Math	HS	Honors Trigonometry/Precalculus	Trigonometric Identities and Equations (6)	Represent and/or analyze mathematical situations and structures using numbers, symbols, words, tables, and/or graphs.	Solve trigonometric equations, using technology when appropriate.	CYMATRPC.D.2.03	
Math	HS	Honors Trigonometry/Precalculus	Trigonometric Identities and Equations (6)	Demonstrate an understanding of patterns, relations, and functions.	Apply sum and difference, double-angle, and half-angle identites for sine and cosine.	CYMATRPC.D.1.10	
Math	HS	Honors Trigonometry/Precalculus	Trigonometric Identities and Equations (6)	Demonstrate an understanding of patterns, relations, and functions.	Verify trigonometric identities.	CYMATRPC.D.1.11	
Math	HS	Honors Trigonometry/Precalculus	Parametric and Polar Equations (7)	Compute accurately and fluently and make reasonable estimates.	Multiply, divide, and find powers and roots of complex numbers in polar form.	CC.2.1.HS.F.6.C	
Math	HS	Honors Trigonometry/Precalculus	Parametric and Polar Equations (7)	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	Represent complex numbers in polar form.	CC.2.1.HS.F.6.A	
Math	HS	Honors Trigonometry/Precalculus	Parametric and Polar Equations (7)	Locate points or describe relationships using the coordinate plane.	Graph polar equations.	CYMATRPC.C.3.02	
Math	HS	Honors Trigonometry/Precalculus	Parametric and Polar Equations (7)	Locate points or describe relationships using the coordinate plane.	Convert from rectangular to polar form and visa versa. (both coordinates and equations)	CYMATRPC.C.3.03	
Math	HS	Honors Trigonometry/Precalculus	Parametric and Polar Equations (7)	Locate points or describe relationships using the coordinate plane.	Introduce vectors in the plane.	CYMATRPC.C.3.06	
Math	HS	Honors Trigonometry/Precalculus	Parametric and Polar Equations (7)	Locate points or describe relationships using the coordinate plane.	Perform vector operations.	CYMATRPC.C.3.07	
Math	HS	Honors Trigonometry/Precalculus	Parametric and Polar Equations (7)	Locate points or describe relationships using the coordinate plane.	Use vectors to represent quantities such as force and velocity.	CYMATRPC.C.3.08	
Math	HS	Honors Trigonometry/Precalculus	Parametric and Polar Equations (7)	Locate points or describe relationships using the coordinate plane.	Graph parametric equations, using technology when appropriate.	CYMATRPC.C.3.09	
Math	HS	Honors Trigonometry/Precalculus	Parametric and Polar Equations (7)	Demonstrate an understanding of patterns, relations, and functions.	Eliminate the parameter and identify the resulting equation.	CYMATRPC.D.1.20	
			Conic Sections (8)	Locate points or describe relationships using the coordinate plane.	Identify properties of the conic sections, including circle, parabolas, ellipses, and hyperbolas.	CC.2.3.HS.A.10A	
			Conic Sections (8)	Locate points or describe relationships using the coordinate plane.	Graph circles, parabolas, ellipses, and hyperbolas, using technology when appropriate.	CC.2.3.HS.A.10B	
			Exponential, Logistic, and Logarithmic Functions (9)	Represent and/or analyze mathematical situations and structures using numbers, symbols, words, tables, and/or graphs.	Convert from exponential to logarithmic form and vice versa.	CC.2.2.HS.D.8A	A2.1.3.1.3

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
			Exponential, Logistic, and Logarithmic Functions (9)	Represent and/or analyze mathematical situations and structures using numbers, symbols, words, tables, and/or graphs.	Use properties of logarithms to rewrite expressions and to solve exponential and logarithmic equations	CC.2.2.HS.D.8B	A2.1.3.1.3
			Exponential, Logistic, and Logarithmic Functions (9)	Demonstrate an understanding of patterns, relations, and functions.	Evaluate exponential and logarithmic expressions, using technology when appropriate.	CC.2.2.HS.D.8C	
			Exponential, Logistic, and Logarithmic Functions (9)	Demonstrate an understanding of patterns, relations, and functions.	Perform transformations by composition, including polynomial, exponential, logarithmic, and trigonometric functions.	CC.2.2.HS.C.2B	
			Exponential, Logistic, and Logarithmic Functions (9)	Demonstrate an understanding of patterns, relations, and functions.	Perform transformations by finding inverses, including polynomial, exponential, logarithmic, and trigonometric functions.	CC.2.2.HS.C.4B	
			Exponential, Logistic, and Logarithmic Functions (9)	Demonstrate an understanding of patterns, relations, and functions.	Graph logarithmic and exponential functions using technology when appropriate.	CC.2.2.HS.C.2C	
Math	HS	Honors Trigonometry/Precalculus	Sequences and Series (10)	Demonstrate an understanding of patterns, relations, and functions.	Write formulas for arithmetic and geometric sequences explicitly and recursively.	CC.2.2.HS.C.3A	A2.2.1.1.2
Math	HS	Honors Trigonometry/Precalculus	Sequences and Series (10)	Demonstrate an understanding of patterns, relations, and functions.	Find terms in arithmetic and geometric sequences.	CC.2.2.HS.C.2D	A2.2.1.1.2
Math	HS	Honors Trigonometry/Precalculus	Sequences and Series (10)	Demonstrate an understanding of patterns, relations, and functions.	Write formulas for arithmetic and geometric series using sigma notation and expanded form.	CC.2.2.HS.C.3B	A2.2.1.1.2
Math	HS	Honors Trigonometry/Precalculus	Sequences and Series (10)	Demonstrate an understanding of patterns, relations, and functions.	Find sums of arithmetic and geometric series.	CC.2.2.HS.C.2E	A2.2.1.1.2
Math	HS	Honors Trigonometry/Precalculus	Sequences and Series (10)	Demonstrate an understanding of patterns, relations, and functions.	Use the binomial theorem to expand the power of a binomial.	CYMATRPC.D.1.21	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Identify the observational units and variables in a data set.	CYMASTAT.E.1.01	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Classify variables as quantitative or categorical.	CYMASTAT.E.1.02	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Construct boxplots, dotplots, stemplots, and histograms of quantitative data.	CYMASTAT.E.1.03	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Construct bar graphs of categorical data.	CYMASTAT.E.1.04	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Construct two-way (contingency) tables for two categorical variables.	CYMASTAT.E.1.05	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Describe statistical tendencies from graphical displays of data.	CYMASTAT.E.1.06	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Determine if two categorical variables are independent or if they have an association by creating segmented bar graphs.	CYMASTAT.E.1.07	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Compare the distribution of a quantitative variable among two groups by creating parallel boxplots, dotplots, stemplots, or histograms.	CYMASTAT.E.1.08	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Construct a scatterplot of two quantitative variables.	CYMASTAT.E.1.09	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	Describe the shape, direction, and strength of the association of two quantitative variables from a scatterplot.	CYMASTAT.E.1.10	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Create the marginal distribution of a categorical variable in a data set with two categorical variables.	CYMASTAT.E.2.01	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Create the conditional distribution of one category of a categorical variable among the categories of another categorical variable.	CYMASTAT.E.2.02	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate the relative risk of one category of a categorical variable among two groups.	CYMASTAT.E.2.03	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Classify the shape of the distribution of a quantitative variable as symmetric, skewed to the left, or skewed to the right.	CYMASTAT.E.2.04	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Identify potential outliers in a data set by looking at boxplots, dotplots, stemplots, or histograms.	CYMASTAT.E.2.05	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate the median and mean of a data set.	CYMASTAT.E.2.06	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Choose the median or mean as the most appropriate measure of center for a data set.	CYMASTAT.E.2.07	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Relate the median and mean to the shape of the data set.	CYMASTAT.E.2.08	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Explain the effect of outliers on the value of the mean and median in data.	CYMASTAT.E.2.09	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate the standard deviation, interquartile range (IQR), and five number summary of a data set.	CYMASTAT.E.2.10	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate the z-score of a datum as a measure of its position.	CYMASTAT.E.2.11	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Determine if a datum is an outlier using the 1.5´IQR criteria.	CYMASTAT.E.2.12	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate the percentile of a datum in an (approximately) Normal data set.	CYMASTAT.E.2.13	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate and interpret the correlation coefficient of two quantitative variables.	CYMASTAT.E.2.14	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate the least-squares regression model for two quantitative variables.	CYMASTAT.E.2.15	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Determine if an observation is influential in the least-squares regression setting.	CYMASTAT.E.2.16	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Interpret the slope and intercept of least-squares regression model.	CYMASTAT.E.2.16	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate and interpret the value of the coefficient of determination.	CYMASTAT.E.2.17	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Explain the danger of extrapolation.	CYMASTAT.E.2.18	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Calculate and interpret the residual of a data value.	CYMASTAT.E.2.19	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Select and/or use appropriate statistical methods to analyze data.	Create a residual plot of a data set given its least-squares regression model.	CYMASTAT.E.2.20	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Conduct simulations of random phenomena to estimate probabilities of events.	CYMASTAT.E.3.01	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Create the probability distribution of a discrete random variable.	CYMASTAT.E.3.02	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Calculate the expected value of a probability distribution.	CYMASTAT.E.3.03	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	List the sample space of a random phenomenon.	CYMASTAT.E.3.04	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Understand and/or apply basic concepts of probability or outcomes.	Find the probability of an event in an (approximately) Normal data set.	CYMASTAT.E.3.05	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Define and give examples of populations and samples.	CYMASTAT.E.4.01	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Define and give examples of parameters and statistics.	CYMASTAT.E.4.02	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Identify the response variable and the explanatory variable in a statistical study.	CYMASTAT.E.4.03	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Differentiate between observational studies and experiments.	CYMASTAT.E.4.04	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Draw a simple random sample (SRS) from a population.	CYMASTAT.E.4.05	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Define an unbiased estimator of a parameter.	CYMASTAT.E.4.06	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Give examples of sampling variability.	CYMASTAT.E.4.07	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Describe a process to randomly assign experimental units to treatment groups.	CYMASTAT.E.4.08	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Simulate the sampling distribution of a sample proportion.	CYMASTAT.E.4.09	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Describe the shape, mean, and standard deviation of the sampling distribution of a sample proportion using the Central Limit Theorem.	CYMASTAT.E.4.10	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Simulate the sampling distribution of a sample mean.	CYMASTAT.E.4.11	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Calculate probabilities of intervals of sample proportions from their sampling distributions.	CYMASTAT.E.4.12	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Describe the shape, mean, and standard deviation of the sampling distribution of a sample mean using the Central Limit Theorem.	CYMASTAT.E.4.13	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Calculate probabilities of intervals of sample means from their sampling distributions.	CYMASTAT.E.4.14	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Construct and interpret a confidence interval for population proportion from sample data.	CYMASTAT.E.4.15	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Conduct and interpret a test of significance about a population proportion from sample data.	CYMASTAT.E.4.16	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Compute probabilities of intervals of t-values from the t distributions.	CYMASTAT.E.4.17	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Construct and interpret a confidence interval for population mean from sample data.	CYMASTAT.E.4.18	

Subject	Level	Course	Unit	Standard	Benchmarks	CY Number for	PA Eligible Content
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Conduct and interpret a test of significance about a population mean from sample data.	CYMASTAT.E.4.19	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Explain the duality of two-sided confidence intervals and tests of significance.	CYMASTAT.E.4.20	
Math	HS	Introduction to Applied Statistics	Data Analysis and Probability	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	Conduct and interpret a chi-square test for Goodness-of-Fit on a categorical variable.	CYMASTAT.E.4.21	