Chapter	Section	Collegeboard Pre-Calc Objectives	Skills	Pacing (School Dav)
R) Review	R.7 Rational Expressions	PC.1.2.1	Finds, interprets, and graphs the sum, difference, product, and quotient (where it exists) of two functions, indicates the relevant domain and range for the resulting function, and provides a graph of the resulting function.	3
	R.8 nth Roots; Rational Exponents	PC.1.1.6	Compares and contrasts characteristics of different families of functions, such as polynomial, rational, radical, power, exponential, logarithmic, trigonometric, and piecewise-defined functions, and translates among verbal, tabular, graphical, and symbolic representations of functions.	3
1) Equations and Inequalities	1.4 Radical, Quadratic, & Factorable Equations	PC.1.1.6	Compares and contrasts characteristics of different families of functions, such as polynomial, rational, radical, power, exponential, logarithmic, trigonometric, and piecewise-defined functions, and translates among verbal, tabular, graphical, and symbolic representations of functions.	3
2) Graphs	2.2 Graphs of Equations	PC.1.1.2	Identifies and applies relationships among significant points of a function (zeros, maximum points, minimum points), the graph of the function, the nature and number of the function's zeros, and the symbolic representation of the function.	3
		PC.1.1.4	Recognizes and describes continuity, end behavior, asymptotes, symmetry (odd and even functions), and limits, and connects these concepts to graphs of functions.	
	2.3 Circles	PC.3.1.1	Determines an equation representing each of the conic sections from its locus description.	3
3) Functions and Their Graphs	3.1 Functions	PC.1.1.1	and graphs, where appropriate.	3
		PC.1.2.1	Finds, interprets, and graphs the sum, difference, product, and quotient (where it exists) of two functions, indicates the relevant domain and range for the resulting function, and provides a graph of the resulting function.	
		PC.1.2.2	Forms the composition of two functions, and determines the domain, range, and graph of the composite function. Composes two functions to determine whether they are inverses.	
	3.2 The Graph of a Function	PC.1.1.1	Determines the domain and range of functions as represented by symbols and graphs, where appropriate.	3
		PC.1.1.2	Identifies and applies relationships among significant points of a function (zeros, maximum points, minimum points), the graph of the function, the nature and number of the function's zeros, and the symbolic representation of the function.	
	3.3 Properties of Functions	PC.1.1.1	Determines the domain and range of functions as represented by symbols and graphs, where appropriate.	3
		PC.1.1.2	Identifies and applies relationships among significant points of a function (zeros, maximum points, minimum points), the graph of the function, the nature and number of the function's zeros, and the symbolic representation of the function.	
	3.4 Library of Functions; Piecewise Functions	PC.1.1.6	Compares and contrasts characteristics of different families of functions, such as polynomial, rational, radical, power, exponential, logarithmic, trigonometric, and piecewise-defined functions, and translates among verbal, tabular, graphical, and symbolic representations of functions.	4
		PC.1.1.7	Describes and contrasts common elementary functions symbolically and graphically, including $x^n$ , $x^-1$ , ln x, log_a x, $e^x$ , $a^x$ , and the basic trigonometric functions.	

	PC.1.2.3	Applies basic function transformations to a parent function $f(x)$ , includinga • $f(x)$ , $f(x) + d$ , $f(x - c)$ , $f(b • x)$ , $ f(x) $ , and $f( x )$ , and interprets the results of these transformations verbally, graphically, and numerically.	
<ul><li>4) Polynomial and Rational Functions</li><li>4.1 Quadratic Functions and Models</li></ul>	PC.3.1.2	Analyzes a quadratic equation in x and y representing a conic with center at (h, k) and involving no rotation, recognizes the type of conic section represented, expresses the equation in a form useful for graphing, and constructs a graph of the conic.	3
	PC.3.1.3	Uses conic sections to model and solve problems from mathematics and other disciplines.	
4.3 Rational Functions I	PC.1.1.1	Determines the domain and range of functions as represented by symbols and graphs, where appropriate.	3
	PC.1.1.4	Recognizes and describes continuity, end behavior, asymptotes, symmetry (odd and even functions), and limits, and connects these concepts to graphs of functions.	
	PC.1.2.3	Applies basic function transformations to a parent function $f(x)$ , includinga • $f(x)$ , $f(x) + d$ , $f(x - c)$ , $f(b • x)$ , $ f(x) $ , and $f( x )$ , and interprets the results of these transformations verbally, graphically, and numerically.	
		Determines the domain and range of functions as represented by symbols	
4.4 Rational Functions II	PC.1.1.1	and graphs, where appropriate.	3
	PC.1.1.4	Recognizes and describes continuity, end behavior, asymptotes, symmetry (odd and even functions), and limits, and connects these concepts to graphs of functions.	
5) Exponential and Logarithmic Functions 5.1 Composite Functions	PC.1.2.2	Forms the composition of two functions, and determines the domain, range, and graph of the composite function. Composes two functions to determine whether they are inverses.	3
5.2 Inverse Functions	PC.1.2.2	Forms the composition of two functions, and determines the domain, range, and graph of the composite function. Composes two functions to determine whether they are inverses.	3
	PC.1.1.1	Determines the domain and range of functions as represented by symbols and graphs, where appropriate.	
5.3 Exponential Functions	PC.1.1.1	Determines the domain and range of functions as represented by symbols and graphs, where appropriate.	3
	PC.1.1.4	Recognizes and describes continuity, end behavior, asymptotes, symmetry (odd and even functions), and limits, and connects these concepts to graphs of functions.	
	PC.1.1.6	Compares and contrasts characteristics of different families of functions, such as polynomial, rational, radical, power, exponential, logarithmic, trigonometric, and piecewise-defined functions, and translates among verbal, tabular, graphical, and symbolic representations of functions.	
	PC.1.1.7	Describes and contrasts common elementary functions symbolically and graphically, including $x^n$ , $x^{-1}$ , $\ln x$ , $\log_a x$ , $e^x$ , $a^x$ , and the basic trigonometric functions.	
5.4 Logarithmic Functions	PC.1.1.1	Determines the domain and range of functions as represented by symbols and graphs, where appropriate.	3
	PC.1.1.4	Recognizes and describes continuity, end behavior, asymptotes, symmetry (odd and even functions), and limits, and connects these concepts to graphs of functions.	

		PC.1.1.6	Compares and contrasts characteristics of different families of functions, such as polynomial, rational, radical, power, exponential, logarithmic, trigonometric, and piecewise-defined functions, and translates among verbal, tabular, graphical, and symbolic representations of functions.	
		PC.1.1.7	Describes and contrasts common elementary functions symbolically and graphically, including $x^n$ , $x^{-1}$ , ln x, log_a x, e^x, a^x, and the basic trigonometric functions.	
		PC.1.2.3	Applies basic function transformations to a parent function f (x), includinga • f (x), f (x) + d, f (x - c), f (b • x),   f (x) , and f ( x ), and interprets the results of these transformations verbally, graphically, and numerically.	
	5.5 Properties of Logarithms	PC.1.1.6	Compares and contrasts characteristics of different families of functions, such as polynomial, rational, radical, power, exponential, logarithmic, trigonometric, and piecewise-defined functions, and translates among verbal, tabular, graphical, and symbolic representations of functions.	3
		PC.1.1.7	Describes and contrasts common elementary functions symbolically and graphically, including x^n, x^ $-1$ , ln x, log_a x, e^x, a^x, and the basic trigonometric functions.	
	5.6 Logarithmic and Exponential Equations	PC.1.1.5	Identifies situations involving functions for which there is no elementary algorithm to find zeros (for example, $a^x = x^n$ ), and distinguishes them as such.	3
		PC.1.1.7	Describes and contrasts common elementary functions symbolically and graphically, including x^n, x^ $-1$ , ln x, log_a x, e^x, a^x, and the basic trigonometric functions.	
6) Trigonometric Functions	6.1 Angles and Their Measure	PC.2.1.2	Develops radian measure of angles, measures angles in both degrees and radians, and converts between these measures.	3
	6.2 Right Triangle Trigonometry	PC.2.1.3	Defines the trigonometric functions as functions of the radian measure of a general angle, and describes them as functions of real numbers.	3
		PC.2.1.7	Develops the fundamental Pythagorean trigonometric identities, sum and difference identities, double-angle identities, and the secant, cosecant, and cotangent functions, and uses them to simplify trigonometric expressions.	
	6.3 Values of Trig. Functs. of Acute Angles	PC.2.1.4	Develops and applies the values of the trigonometric functions at 0, $\pi/6$ , $\pi/4$ , $\pi/3$ , $\pi/2$ radians and their multiples	4
	6.4 Trigonometric Functions of General Angles	PC.2.1.1	Develops and applies the definition of the sine and cosine functions of the degree measure of a general angle in standard position* in relation to the values of the y- and x-coordinates, respectively, of points on the terminal side of the angle.	4
		PC.2.1.4	Develops and applies the values of the trigonometric functions at 0, $\pi/6$ , $\pi/4$ , $\pi/3$ , $\pi/2$ radians and their multiples	
	6.5 Unit Circle, Properties of Trig. Functions	PC.1.1.1	Determines the domain and range of functions as represented by symbols and graphs, where appropriate.	3
		PC.2.1.1	Develops and applies the definition of the sine and cosine functions of the degree measure of a general angle in standard position* in relation to the values of the y- and x-coordinates, respectively, of points on the terminal side of the angle.	
		PC.2.1.4	Develops and applies the values of the trigonometric functions at 0, $\pi/6$ , $\pi/4$ , $\pi/3$ , $\pi/2$ radians and their multiples	

	6.6 Graphs of the Sine and Cosine Functions	PC.2.1.5	Constructs the graphs of the trigonometric functions, and describes their behavior, including periodicity, amplitude, zeros, and symmetries.	4
		PC.2.2.1	Graphs functions of the form $f(t) = A \sin(Bt + C) + D \text{ or } g(t) = A \cos(Bt + C) + D$ , and interprets A, B, C, and D in terms of amplitude, frequency, period, and vertical and phase shift.	
	6.7 Graphs of Tan, Cot, Csc, and Sec	PC.2.1.5	Constructs the graphs of the trigonometric functions, and describes their behavior, including periodicity, amplitude, zeros, and symmetries.	4
7) Analytic Trigonometry	7.1 The Inverse Sine, Cosine, and Tangent	PC.2.1.6	Defines and graphs inverses of trigonometric functions with appropriately restricted domains.	3
	7.2 The Inverse Trig. Functions (Cont.)	PC.2.1.6	Defines and graphs inverses of trigonometric functions with appropriately restricted domains.	3
	7.3 Trigonometric Identities	PC.2.1.7	Develops the fundamental Pythagorean trigonometric identities, sum and difference identities, double-angle identities, and the secant, cosecant, and cotangent functions, and uses them to simplify trigonometric expressions.	4
	7.4 Sum and Difference Formulas	PC.2.1.7	difference identities, double-angle identities, and the secant, cosecant, and cotangent functions, and uses them to simplify trigonometric expressions.	3
	7.5 Double-Angle and Half-Angle Formulas	PC.2.1.7	Develops the fundamental Pythagorean trigonometric identities, sum and difference identities, double-angle identities, and the secant, cosecant, and cotangent functions, and uses them to simplify trigonometric expressions.	3
	7.7 Trigonometric Equations (I)	PC.2.2.3	Solves trigonometric equations, noting the periodic nature of solutions when applicable, and interprets the solutions graphically.	3
	7.8 Trigonometric Equations (II)	PC.2.2.3	Solves trigonometric equations, noting the periodic nature of solutions when applicable, and interprets the solutions graphically.	4
8) Applications of Trigonometric Functions	8.2 The Law of Sines	PC.2.1.8	Develops the Law of Sines and the Law of Cosines, and uses them to find the measures of unknown sides and angles in triangles.	3
	8.3 Law of Cosines	PC.2.1.8	Develops the Law of Sines and the Law of Cosines, and uses them to find the measures of unknown sides and angles in triangles.	3
9) Polar Coordinates	0.1 Polor Coordinates		Everyopped points in the plane in both restance lar and relar forms	0
	9.1 Polar Coordinates	PU.3.2.1	Expresses points in the plane in both rectangular and polar forms.	3
		PC.3.2.2	in both rectangular and polar forms.	
	0.2 The Complex Distance De Mainste		Deletes and uses restangular and polar representations of samely	
	9.3 The Complex Plane; De Molvre's Theorem	PC.2.2.2	numbers, and uses DeMoivre's theorem.	3
	9.4 Vectors	PC.5.1.1	Defines vectors in two dimensions as objects having magnitude and direction, and represents them geometrically.	4
		PC.5.1.2	Illustrates and applies the properties of vector addition and scalar multiplication to represent, investigate, and solve problems.	
		PC.5.1.3	Uses vectors in modeling physical situations to solve problems.	
		PC.5.1.4	Models geometric translations with vector addition to solve problems.	

10) Analytic Geometry	10.2 The Parabola	PC.3.1.1	Determines an equation representing each of the conic sections from its locus description.	3
		PC.3.1.2	Analyzes a quadratic equation in x and y representing a conic with center at (h, k) and involving no rotation, recognizes the type of conic section represented, expresses the equation in a form useful for graphing, and constructs a graph of the conic.	
		PC.3.1.3	Uses conic sections to model and solve problems from mathematics and other disciplines.	
	10.3 The Ellipse	PC.3.1.1	Determines an equation representing each of the conic sections from its locus description.	3
		PC.3.1.3	Uses conic sections to model and solve problems from mathematics and other disciplines.	
	10.4 The Hyperbola	PC.3.1.1	Determines an equation representing each of the conic sections from its locus description.	3
		PC.3.1.3	Uses conic sections to model and solve problems from mathematics and other disciplines.	
	10.7 Plane Curves and Parametric Equations	PC.5.2.1	Uses parametric equations to represent situations involving motion in the plane, including motion on a line, motion of a projectile, and motion of objects in orbits.	5
		PC.5.2.2	Converts between a pair of parametric equations and an equation in x and y to interpret the situation represented.	
		PC.5.2.3	Analyzes planar curves, including those given in parametric form.	
Total Sections Covered	42		Total Davs	133