Geometry Summer Assignment Name:_____

1. Solving equations

https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-variables-expressions/cc-7th-2-step-equations/v/why-we-do-the-same-thing-to-both-sides-two-step-equations

a) $2x - 16 = 8$

b) $2y - 3 + 5y = 9$

c) $7x + 9 = 13x - 27$

d) $-8w + 34 = 5w - 18$

e) $3(5x + 10) = 180$

f) $\frac{1}{2}(9x + 14) = 59$

g) $x^2 - 14 = 16$

h) $5y^2 + 18 = 63$

2. Proportions and Fractions

https://www.khanacademy.org/math/algebra-basics/core-algebra-foundations/algebra-foundations-decimal-operations/e/converting_fractions_to_decimals

https://www.khanacademy.org/math/algebra-basics/core-algebra-foundations/algebra-foundations-decimal-operations/v/finding-percentages-example

https://www.khanacademy.org/math/algebra-basics/core-algebra-linear-equations-inequalities/ratios-core-algebra/v/proportions-2-exercise-examples

Complete the table

Fraction	Decimal	Percent
4/5		
	1.05	
		8%
	0.015	
1 7/8		

Solve each proportion

a) $\frac{5x}{7} = \frac{8}{9}$

b) $\frac{2}{5} = \frac{3}{y}$

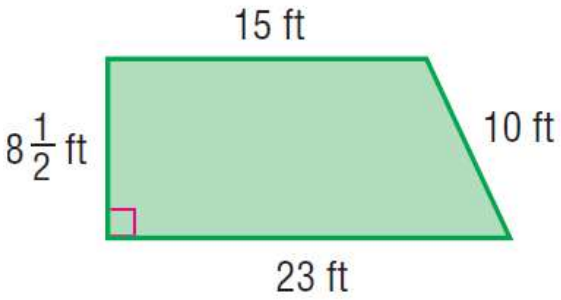
c) $\frac{x-2}{4} = \frac{x+3}{6}$

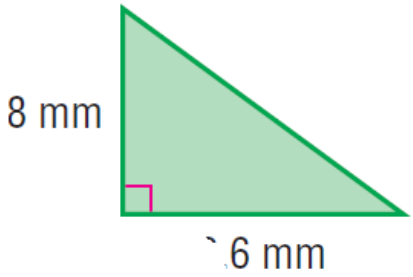
d) $\frac{2x-5}{6} = \frac{10}{3}$

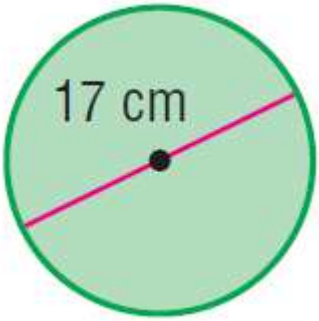
3. Area and Perimeter. Find area and perimeter for each shape. (Leave answers for circles in terms of π)

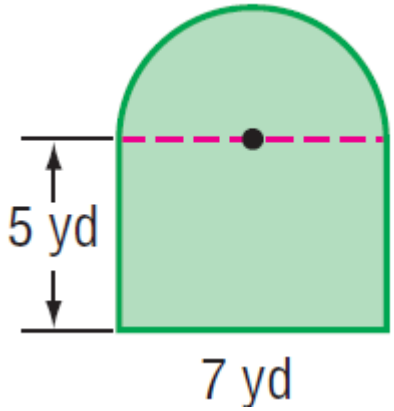
https://www.khanacademy.org/math/basic-geo/basic-geo-area-perimeter/basic-geo-area-perimeter-polygon/v/perimeter-and-area-basics

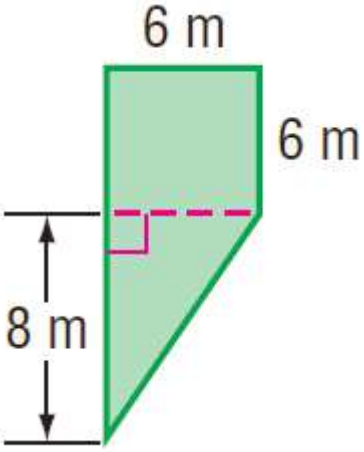
https://www.khanacademy.org/math/geometry/right_triangles_topic/pyth_theor/v/the-pythagorean-theorem

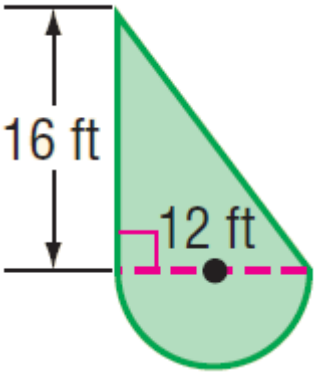












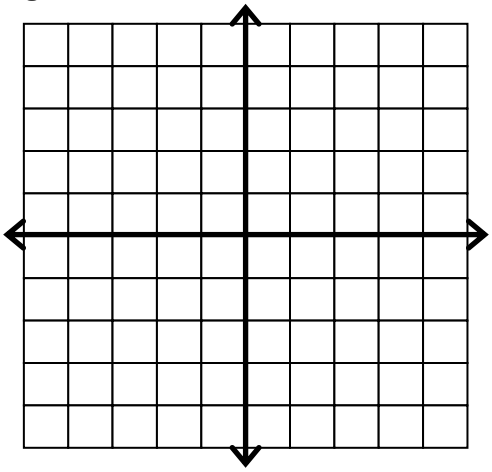
4. Linear equations

https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-linear-equations-functions/8th-slope/v/graphing-a-line-in-slope-intercept-form

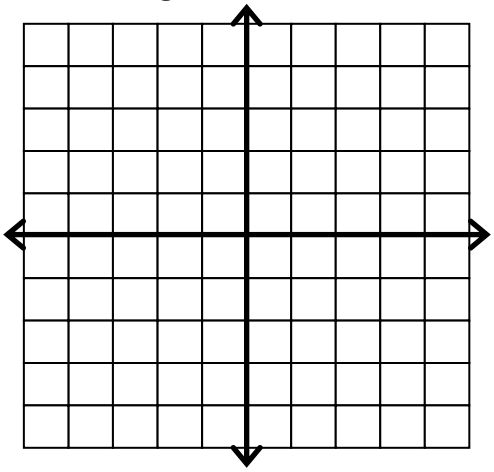
https://www.khanacademy.org/math/algebra-basics/core-algebra-graphing-lines-slope/core-algebra-slope/v/slope-of-a-line

Graph each line.

y = ½ x – 1



2x + 3y = 6



List slope and x and y intercepts for the lines above.

m = _____

x int = _____

y int = _____

m = _____

x int = _____

y int = _____

Find the slope of the line through each pair of points and write an equation for the line through them in point-slope and slope intercept form.

a) A(-5, 3) B(1, - 1)

b) C(9/2, 6) D(7, -4)

5. Quadratics and Parabolas

https://www.khanacademy.org/math/algebra/quadratics/solving_graphing_quadratics/v/graphs-of-quadratic-functions

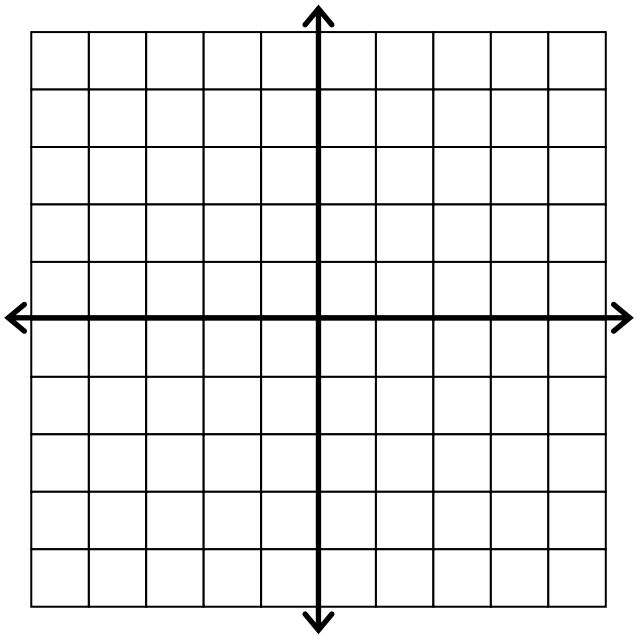
https://www.khanacademy.org/math/algebra/multiplying-factoring-expression/Factoring-simple-expressions/v/factor-polynomials-using-the-gcf

https://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-by-grouping/v/factor-by-grouping-and-factoring-completely

https://www.khanacademy.org/math/algebra/multiplying-factoring-expression/factoring-quadratic-expressions/v/factoring-quadratic-expressions

https://www.khanacademy.org/math/algebra2/polynomial_and_rational/quad_factoring/v/example-1-solving-a-quadratic-equation-by-factoring

Graph the parabola $y = x^2 - 2x - 3$



State each of the following

Vertex _____

Axis of Symmetry _____

Y intercept _____

X intercepts (roots) _____

Factor each of the following expressions

$4x^2y - 10xy^2$

$30a^2b - 60ab^2 + 90a^2b^2$

$x^2 + 15x + 56$ `

$5y^2 - 12x - 9$

Solve each equation

$(y - 5)(2y + 3) = 0$

$x^2 - 11x + 10 = 0$

6. Simplify each of the following expressions

https://www.khanacademy.org/math/algebra-basics/core-algebra-foundations/square-roots-for-college/v/understanding-square-roots

https://www.khanacademy.org/math/algebra/exponent-equations/exponent-properties-algebra/v/exponent-properties-4

http://www.regentsprep.org/regents/math/algebra/AV3/Smul_bin.htm

https://www.khanacademy.org/math/algebra/introduction-to-algebra/manipulating-expressions/v/combining-like-terms-and-the-distributive-property

$-\sqrt{275}$

$3\sqrt{12}$

$\sqrt{\frac{36}{25}}$

$2\sqrt{54} - 3\sqrt{96}$

$\sqrt{3}\left(\sqrt{5} + \sqrt{3}\right)$

$\left(4a^2bc\right)\left(-2b^3c^2\right)$

$4ab(3a^2 - 7b)$

$(6g - 7)(6g + 7)$

$$\frac{15x^4y^2z^5}{3x^2z^3}$$

$5(5 + t) - 3(t - 6)$

7. Solve each system of equations.

Elimination: https://www.youtube.com/watch?v=K9IG-aCHCSE

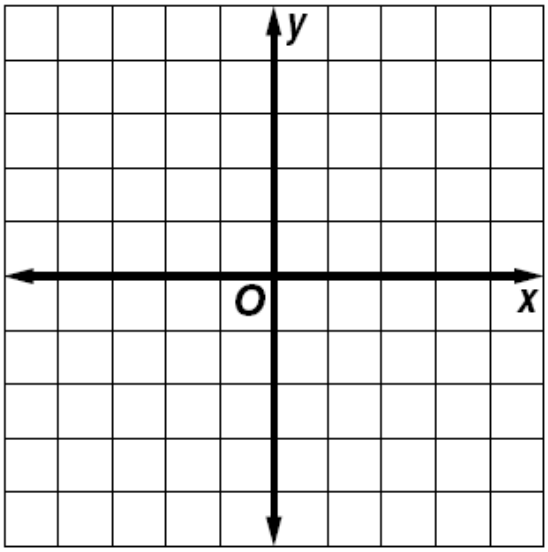
Substitution: https://www.youtube.com/watch?v=cwHR_B9zK7k

$$\begin{aligned} y &= 6x \\ 2x + 3y &= -20 \end{aligned}$$

$$\begin{aligned} 2x - 4y &= -22 \\ 3x + 3y &= 30 \end{aligned}$$

Solve the system by graphing.

$$2x - y = 1$$
$$y = -3$$



8. Simplify each expression (Number Sense)

http://www.virtualnerd.com/middle-math/number-algebraic-sense/order-operations/simplify-expression-order-operations

15 + (-19) – 8 + (-5)

-76 - - 57

18 – 29

(-23) + (-42) + (91)

5 – 6(-4 + 3)

23 + 8(-9 – 7)

$(-9)(3)(-1)(-4)$

$-6^2 - 4(-3)^2$

$7^2 - 8(2 - 9)$

$-4^3 + 8(-3)(-2)$

Evaluate each of the following if x= -5, y = 7, and z = -3

$xy - z$

$x^2y + z^3$

$x(yz - x^2)$

$x + y + z - xyz$

9. Simplify each rational expression.

https://www.youtube.com/watch?v=-YMVu5nFvzc

https://www.youtube.com/watch?v=Znm2F09whmY

$\frac{3}{4}+\frac{5}{6}-\frac{2}{3}$

$2\frac{1}{5}-4\frac{1}{3}$

$\frac{3}{4}\left(5+4\frac{1}{2}\right)$

$3\frac{1}{4}\times 2\frac{4}{5}$

$\frac{3}{4}\div\frac{5}{6}$

$1\frac{2}{3}\div\frac{5}{6}$

Evaluate if a = 1/3, b = 2.5 and c = 4/7

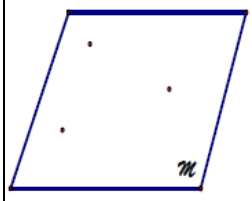
a(b + c)

a – b ÷ c

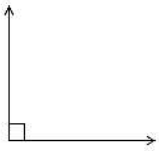
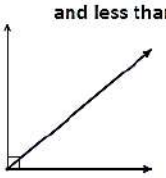
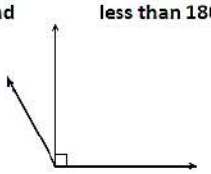
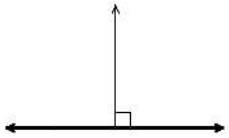
GEOMETRY REVIEW/PREVIEW (REFERENCE SHEETS)

You should know the following vocabulary from previous math classes. Please review the terms and definitions.

The three undetermined terms in geometry are: point, line and plane. These are also called the "Building Blocks of Geometry" because everything is based on these 3 ideas. We are able to describe them but not able to define them.

Vocabulary Term	Description/Definition	Diagram	Symbol Explanation	Symbol
Point	A **point** is the basic unit in geometry. It has no size – infinitely small. It represents locations. Use a dot to represent a point.		Name a point by using a capital printed letter.	A
Line	A **line** is a straight arrangement of points – it is made up of an infinite number of points. It extends infinitely in two directions but has no thickness.		Name a line by using 2 points that are on the line and putting $\leftrightarrow$ above these 2 letters. The letters may be in any order.	$\overleftrightarrow{AB}$ $\overleftrightarrow{BA}$
Line Segment	A **line segment** consists of 2 points and all the points between them that lie on the line containing them.		Name a line by using 2 points that are on the line and putting $\overline{}$ above the 2 letters. The letters may be in any order.	$\overline{PQ}$ $\overline{QP}$
Ray	A **ray** is a part of a line. It contains one endpoint and all of the points on that line to one side of it.		Always name a ray by two points. First name the endpoint, then name the point that it goes through. Put a ray symbol above the letters: $\rightarrow$ Note: the ray symbol always faces to the right, no matter which way the ray is facing.	$\overrightarrow{QP}$
Plane	A **plane** has length and width but no thickness – it is a flat surface that extends indefinitely.		Name a plane by either 3 points that are on the plane or a capital script letter that can be found in the corner of the plane. Note: you may not name a plane with 3 points that are all on the same line.	CDE CED DEC DCE EDC ECD plane $\mathcal{M}$ $\mathcal{M}$

- Angles

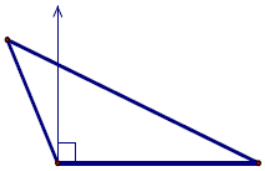
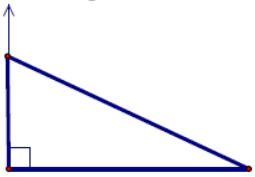
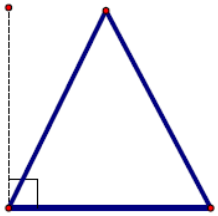
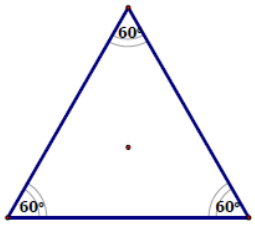
Right Angle: measures exactly 90°	Acute Angle: Measures more than 0° and less than 90°	Obtuse Angle: Measures more than 90° and less than 180°	"Straight Angle": Measures 180°
			

- Polygons

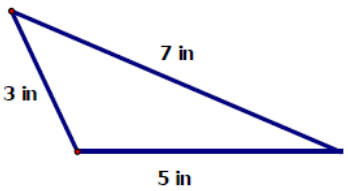
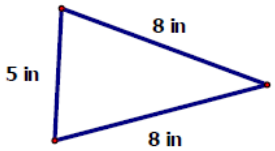
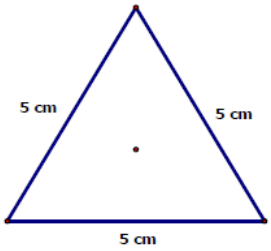
# of Sides	Name
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon

# of Sides	Name
7	Septagon
8	Octagon
9	Nonagon
10	Decagon

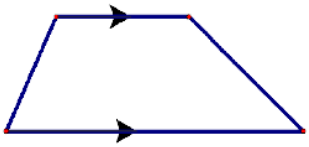
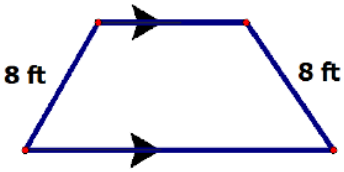
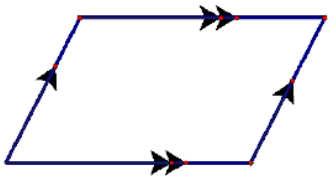
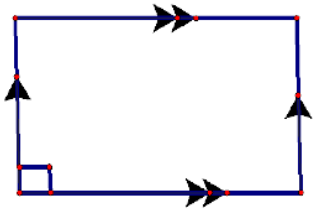
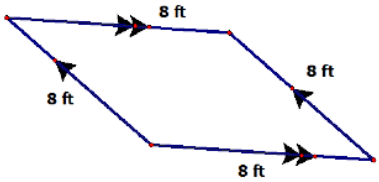
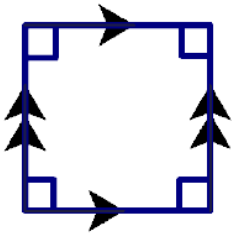
- There are special kinds of triangles. Triangles may be classified by their angle measures.

Obtuse Triangle: has one obtuse angle and two acute angles	Right Triangle: has one right angle and two acute angles	Acute Triangle: has three acute angles	Equiangular Triangle: special kind of acute triangle, all 3 angles measure 60°
			

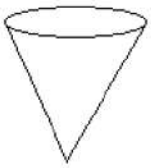
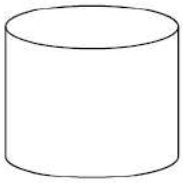
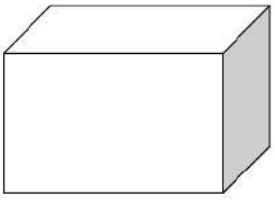
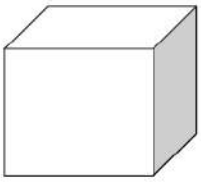
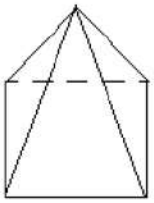
Triangles may also be classified by their side lengths.

Scalene Triangle: no sides are the same length	Isosceles Triangle: at least two sides are the same length	Equilateral Triangle: all three sides are the same length
		

- **There are special kinds of quadrilaterals.**

Trapezoid: has one pair of parallel sides (called bases… shown to be parallel by use of arrows) 	**Isosceles Trapezoid: has one pair of parallel sides and the other two sides are the same length** 	**Parallelogram: has two pairs of parallel sides** 
Rectangle: parallelogram with four right angles 	**Rhombus: parallelogram with four sides that are the same length** 	**Square: parallelogram with four right angles and four sides that are the same length** **All sides measure 5 feet** 

- **Three dimensional figures**

Cone 	**Cylinder** 	**Sphere** 
Rectangular Prism 	**Cube (prism with 6 square faces that are the same size)** 	**Pyramid** 

π equals approximately 3.14

Circumference	circle	$C = 2\pi r$
Area	triangle	$A = \frac{1}{2}bh$
	trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$
	circle	$A = \pi r^2$
Surface Area	right cylinder	$S = 2\pi rh + 2\pi r^2$
	sphere	$S = 4\pi r^2$

Volume	rectangular prism	$V = lwh$
	cylinder	$V = \pi r^2 h$
	cone	$V = \frac{1}{3}\pi r^2 h$
	sphere	$V = \frac{4}{3}\pi r^3$
Pythagorean Theorem	right triangle	$a^2 + b^2 = c^2$