Stonington High School

Geometry Summer Packet

The problems in this packet are designed to help you review topics from 7th and 8th grade that are important to your success in Geometry. The topics covered in this packet should be addressed and reviewed before entering Geometry. Examples have been provided in each section to help you get started and refresh your memory of these concepts.

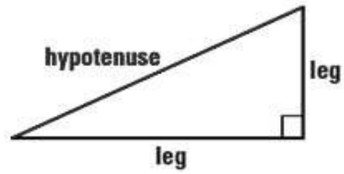
This packet is due on the first day of school and will count as extra credit on your first test of the school year in Geometry!

Name:_

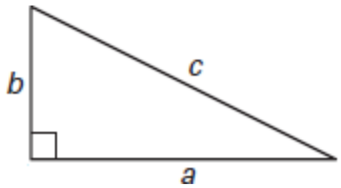
Topic 1: Right Triangles

Notes:

In a <u>right</u> triangle, the sides that form the right angle are the *legs* of the triangle. The side opposite the right angle is the *hypotenuse* of the triangle.



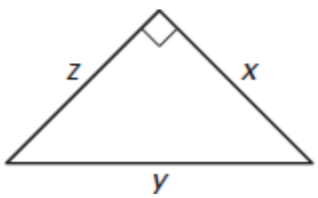
Example: **Identify the legs and hypotenuse in the triangles below.**



Side a: Leg
Side b: Leg
Side c: Hypotenuse

Problem Set: **Identify the legs and hypotenuse in the triangles below.**

1)



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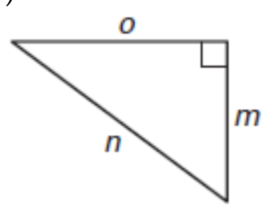
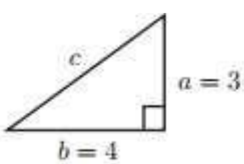


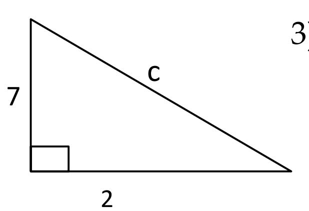
Example: **Use the Pythagorean Theorem** $a^2 + b^2 = c^2$ **to determine the missing side.**



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 3^2 + 4^2 &= c^2 \\ 9 + 16 &= c^2 \\ 25 &= c^2 \\ 5 &= c \end{aligned}$$

Problem Set: **Use the Pythagorean Theorem** $a^2 + b^2 = c^2$ **to determine the missing side.**

3)



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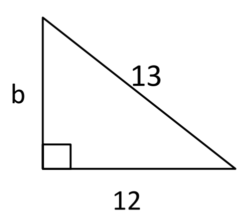


Name:____

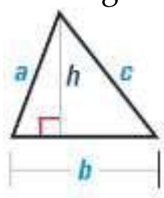
Topic 2: Perimeter & Circumference

Notes:

Perimeter is the distance around the outside of an object. It is measured in linear units (inches, meters, centimeters, etc.)

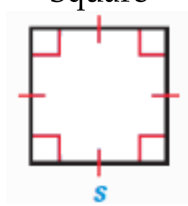
Perimeter/Circumference Formulas:

Triangle



$P = a + b + c$

Square

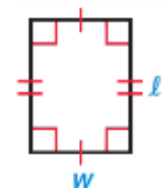


$P = 4s$

Circle

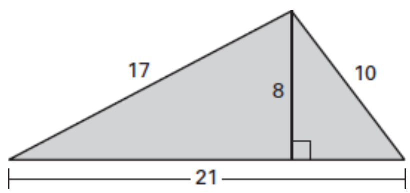
$C = 2\pi\, r$

Rectangle



$P = 2l + 2w$

Examples: **Find the perimeter**

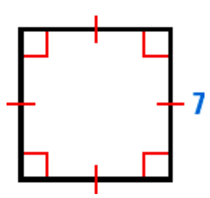


Add all the **outer sides**. Since 8 is the height of the triangle and not the length of one of the sides, we do not use it to find the perimeter.

17 + 10 + 21 = 48 units

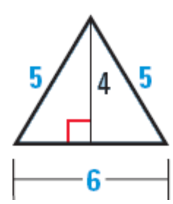
Problem Set: **Find the perimeter or circumference. Use π = 3.14159. DO NOT ROUND!**

1)



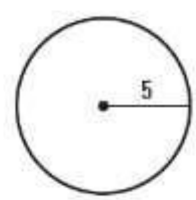
P = ______________

2)



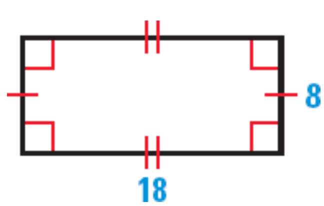
P = ______________

3)



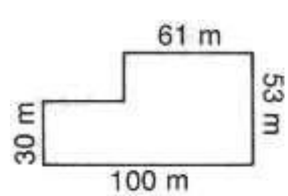
C = ______________

4)



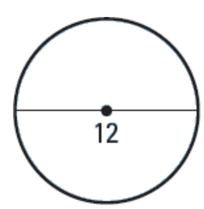
P = ______________

5)



P = ______________

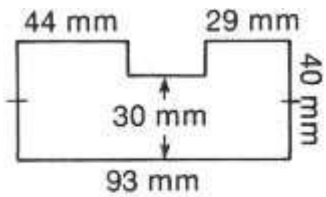
6)



C = ______________

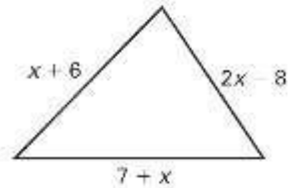
7)

Name:_



P = _______________

8) The perimeter of the triangle is 73. Solve for x.



x = _______________

Name:_______________________________

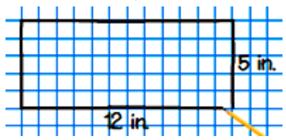
Topic 3: Area

Notes:

Area is a quantity expressing the two-dimensional size of a surface. It is measured in square units; square inches (in^2), square centimeters (cm^2), square miles (mi^2). Think of area as the amount of floor tiles needed to cover a floor.

Example:

Find the area of the rectangle.



$A = lw$ Area formula for a rectangle

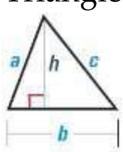
Plug in appropriate values

$A = (12)(5)$ Evaluate

$A = 60in^2$

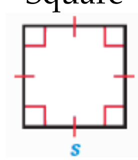
Area Formulas:

Triangle



$A = \frac{1}{2}bh$

Square

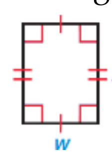


$A = s^2$

Circle

$A = \pi r^2$

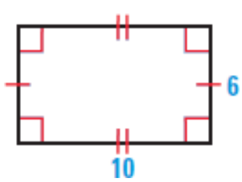
Rectangle



$A = lw$

Problem Set: **Find the area of the figure. Use π = 3.14. DO NOT ROUND!**

1)



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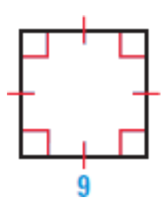

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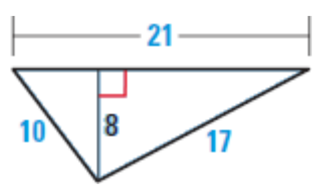

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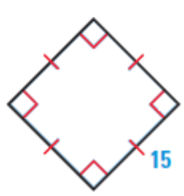
5)



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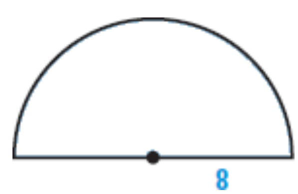


Name:____

Topic 4: Parallel and perpendicular lines

Notes and Examples:

Parallel Lines: Two lines that lie in the same plane and do not intersect are called parallel lines. If two lines have the same slope, they are parallel. Y= 2x +5 and Y= 2x -7 are parallel because they both have a slope of 2.

Perpendicular Lines: Two lines that lie in the same plane and intersect to form 90 degree angles are called perpendicular lines. If the slope of two lines are opposite reciprocals, they are perpendicular.

The lines $y = 3x - 4$ and $y = -\frac{1}{3}x + 5$ are perpendicular because 3 and $-\frac{1}{3}$ are **opposite reciprocals**

Problem Set – **Determine whether each set of equations are parallel, perpendicular, or neither.**

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

2) $y = 4x + 2$
$y=\frac{1}{4}x - 5$

3.) $y = \frac{-1}{2}x$
$y = 2x + 1$

4) $y = \frac{5}{2}x + 3$
$y = \frac{-5}{2}x - 6$

Name:_

Topic 5: Solving Equations

Examples: **Solve for x.**

$15x + 20 + 5x + 8 = -5 - 7$

$20x + 28 = -12$	Comb. Like Terms
$\underline{-28 = -28}$	Subtract 28.
$20x = -40$	Simplify.
$\frac{20x}{20} = \frac{-40}{20}$	Divide by 20.
$x = -2$	Simplify.

$7(x - 3) = 8x + 2$

$7x - 21 = 8x + 2$	Distribute.
$\underline{-7x = -7x}$	Subtract $7x$.
$-21 = x + 2$	Simplify.
$\underline{-2 = -2}$	Subtract 2.
$-23 = x$	Simplify.

$x^2 - 2 = 34$

$\underline{+2 = +2}$	Add 2.
$x^2 = 36$	Simplify.
$\sqrt{x^2} = \sqrt{36}$	Square Root
$x = \pm 6$	

Problem Set - **Solve for x. Show all work. (Some answers may be decimals).**

1) $12 + x = 5$

2) $12 = -3x$

3) $9x - 1 = 44$

4) $2x - 6 = 4x - 14$

5) $5x - 2 - 3 = 25$

6) $2x - 7 + 8x = -5 + 18$

7.) $\frac{4}{5}x = 8$

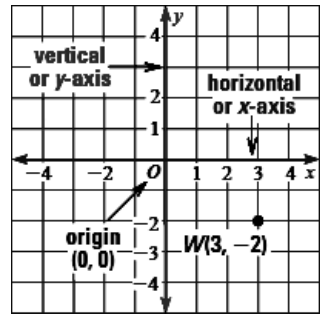
8.) $\frac{1}{3}x - 4 = 7$

Name:_______________________________

Topic 6: Plotting Points

Notes & Examples

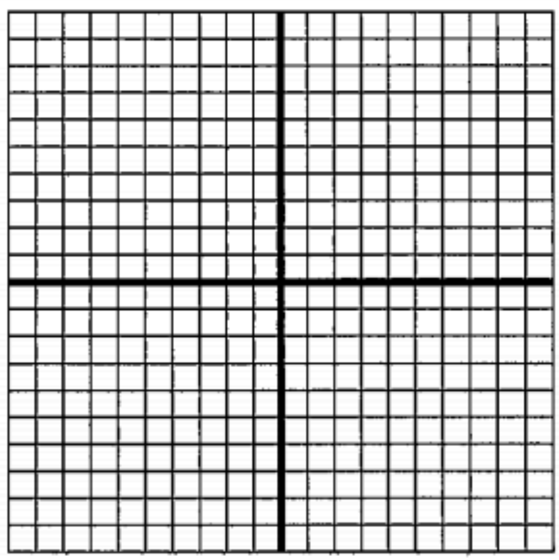
In two dimensions, plot the points on the coordinate plane. The coordinate plane is made-up of the horizontal *x-axis* and the vertical *y-axis*. Each point in the coordinate plane corresponds to an ordered pair of real numbers. For example, the ordered pair *W*(3, -2), has an *x*-coordinate of 3 and a *y*-coordinate of -2. It would be represented by the following:



Problem Set: **Plot and label the following points on the coordinate plane.**

Problem Set: **Plot and label the following points on the coordinate plane.**

A (4,8) B (−2,10) C(−4,−6) D(7,−3) E(−10,0) F (0, 6)



Problem Set: **Using the points from above, calculate the slope of:**

Calculating Slope: If the coordinates of two points on a non-vertical line are (x_1, y_1) and (x_2, y_2) then m, the slope of the line is given by $m = \frac{y_2-y_1}{x_2-x_1}$

$$(2,3), (-5,1) \rightarrow m = \frac{1-(-3)}{-5-2} \rightarrow \boxed{m = -\frac{4}{7}}$$

Problem Set: **Using the points from above, calculate the slope of:**

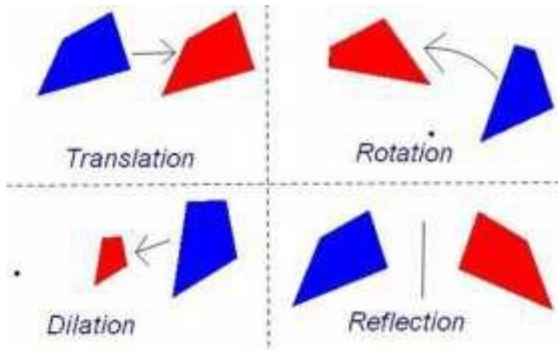
1) $\overline{EF}$ **2)** $\overline{AB}$

Name:_

Topic 7: Transformations

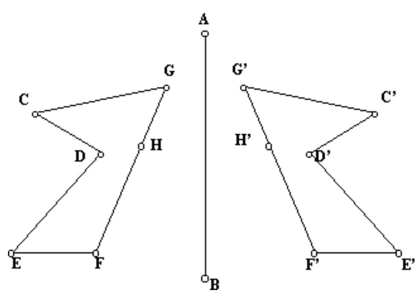
Notes:

There are four basic transformations that move a shape on the coordinate plane.



Problem Set: **Identify each transformation.**

1)



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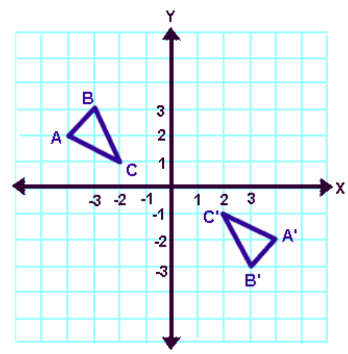

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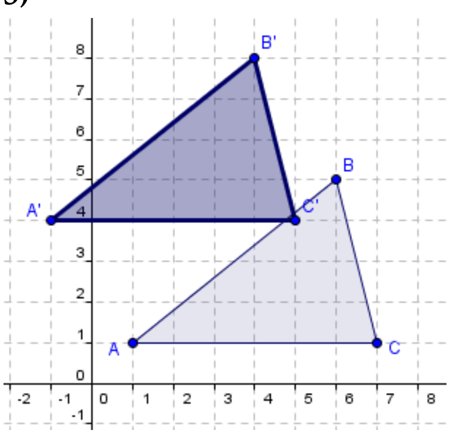

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