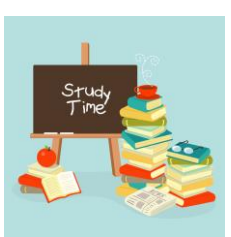# Geometry Reflective Portfolio
Unit #5: Similarity

Section #1: Vocabulary (words and/or diagrams)

Similar figures -	Dilation Transformation – include dilation notation	Scale factor-
Mid-segment of a triangle	Geometric mean (mean proportion)	

Section #2: Formulas/Equations/Theorems (show work for examples)

1. What 2 properties do similar triangles possess:

    o   Corresponding sides are_____

    o   Corresponding angles are_____

Example: Find the height of the flagpole to the nearest ft.   *ans. 20 ft.*

x

6 ft

15 ft   4.5 ft
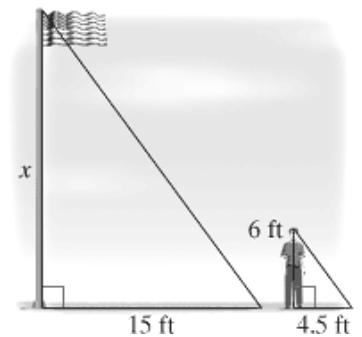
2. What are the three triangle similarity theorems? Describe each.
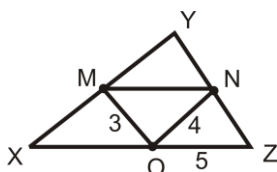   1)

    2)

    3)

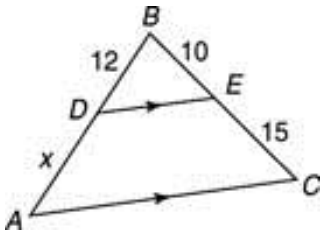3. Mid-segment Theorem (3 properties about a mid-segment):

    a. _____

    b. _____

    c. _____

Example: M, N and O are midpoints of $\overline{XY}$., $\overline{YZ}\ and\ \overline{XZ}$ respectively, **Find the perimeter of ΔXYZ .**

Y

M   N

3   4

X   Z

O   5

4. **Triangle Proportionality Theorem (<u>aka Side-Splitter Theorem</u>): Write it out!**

_____

_____

<u>Example:</u> Find the value of **x.** _ans. 18_
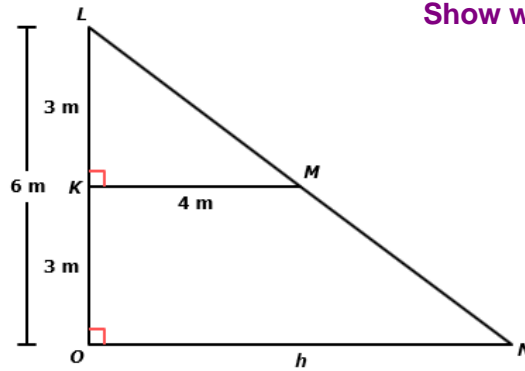

Show work:

<u>Non-example:</u> Find the value of **h**. _ans. 8_
Why is this a non-example of this theorem?
Show work:

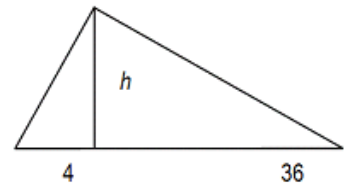
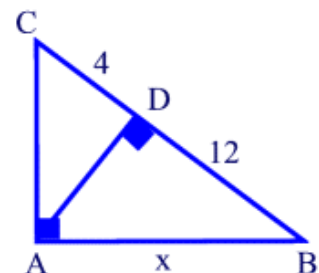5. **State the 2 <u>right triangle</u> mean proportion similarity theorems. Then apply each theorem to the given example.**

1) **Altitude theorem-**

_____

_____

2) **Leg theorem-**

_____

_____

Example: Find the altitude h. _ans. 12_
Show work!

Example: Find the length of leg AB in simplest radical form. _ans. 8√3_
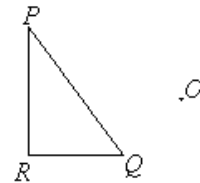**Show work!**

<u>Section #3: Key methods and concepts :</u>

1. **How do you construct a dilation using a <u>compass and straight edge</u>?**
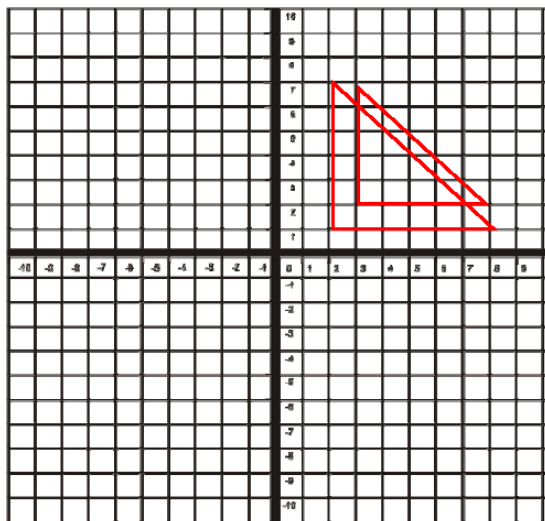
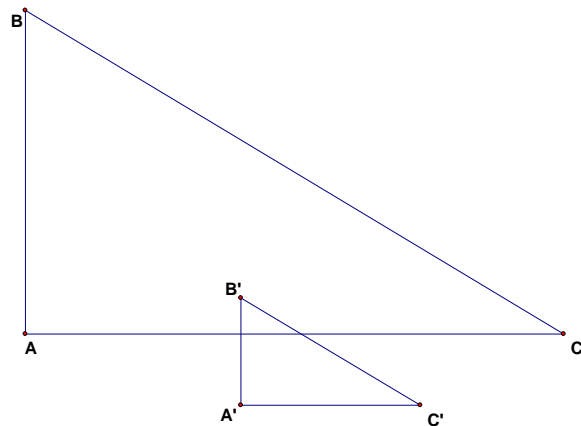   <mark>Do this example using a compass/straightedge:</mark>   **Example: $D_{O,\,2}(\triangle PRQ)$**

2. **How do you find the center of dilation on and off the coordinate plane AND the scale factor?**

   Example: Coordinate plane   **Example: Non- coordinate plane**

Example: Coordinate plane:
a) Locate the center of dilation on the graph and state its coordinates _____

b) State the scale factor:_____
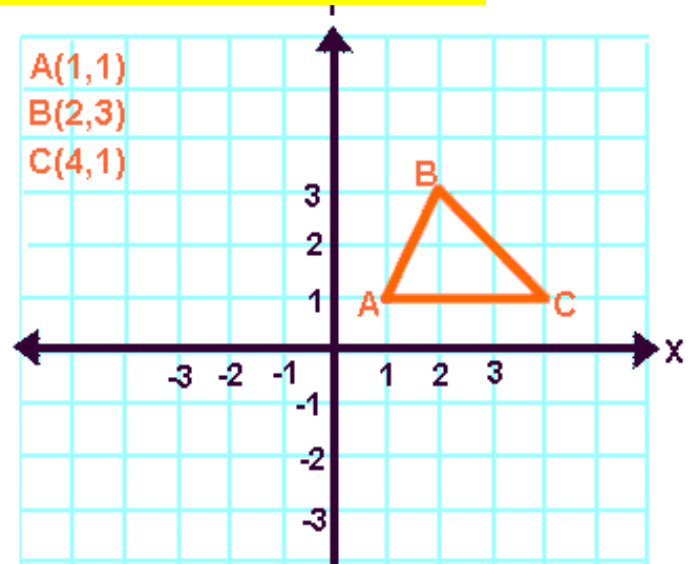
Example: Non- coordinate plane
a) Locate the center of dilation on the diagram above and label it as point O.
b) State the scale factor:_____

3. What is the difference between a positive and negative scale factor?

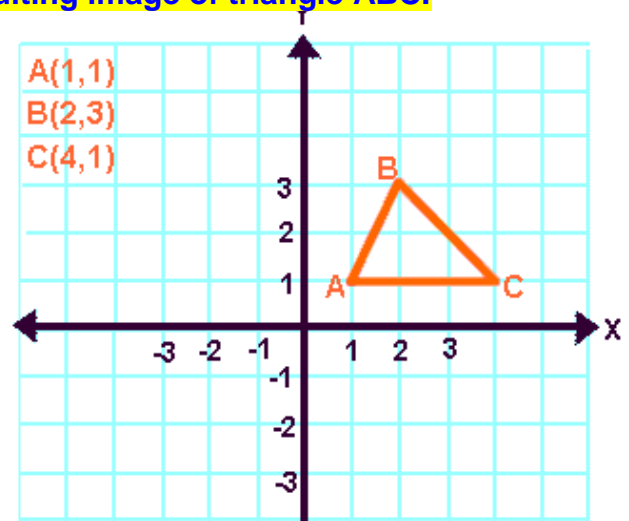**4. How do you dilate a figure on the coordinate plane with the center at the origin?**

<mark>Graph and state the coordinates of A'B'C' after a dilation of scale factor ½.</mark>

A(1,1)
B(2,3)
C(4,1)

5. How do you dilate a figure on the coordinate plane with the center that is not the origin?

<mark>Graph and state the coordinates of the resulting image of triangle ABC.</mark>

$$D_{(3,0),2}(\Delta ABC)$$

A(1,1)
B(2,3)
C(4,1)

6. Write the equation in point-slope form of the perpendicular bisector of the segment with endpoints (-2, 4) and (4, 0).

7. How do you <u>find the rule</u> to dilate a figure on the coordinate plane with the center that is not the origin?

Write out the 3 step process using the given example and then dilate the B(6, 9) by a scale factor of 2/3 and center of dilation at (3, -6).

1) Translate (3, -6) to the origin:

2) Multiply by the scale factor of 2/3

3) Now, translate back to the center of dilation(undo step #1):

RULE:_____   B':_____

8. How do you dilate a line on the coordinate plane?
   The line y = 5x – 6 is dilated by a scale factor of 3/2 and centered at the origin.
   What is the equation of the image of the line after the dilation?

<u>Show the steps for this process:</u>

9. State the missing reasons by completing each sentence.

$\triangle ABC \sim \triangle DEC$ **AA similarity theorem.**

$\dfrac{AB}{DE} = \dfrac{AC}{DC}$ Corresponding _____ of similar triangles are in_____.
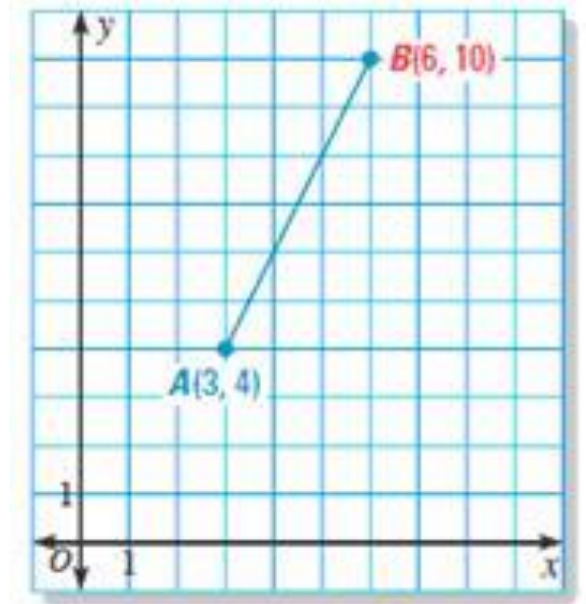
$(AB)(DC) = (AC)(DE)$ The product of the means_____

_____

10. $\dfrac{S_1}{S_2} = \dfrac{P_1}{P_2}$ side ratio = perimeter ratio $\left(\dfrac{S_1}{S_2}\right)^2 = \dfrac{A_1}{A_2}$ area ratio = the square of the side ratio

The ratio of corresponding sides for similar triangles is 3:7, what is the ratio of their perimeters?_____   their areas?_____

11. Partition a segment

a) Find the coordinates of point P which divides the directed segment AB into a ratio of 1: 2.

b) Find the coordinates of point J that would be 2/3 the way from B to A.