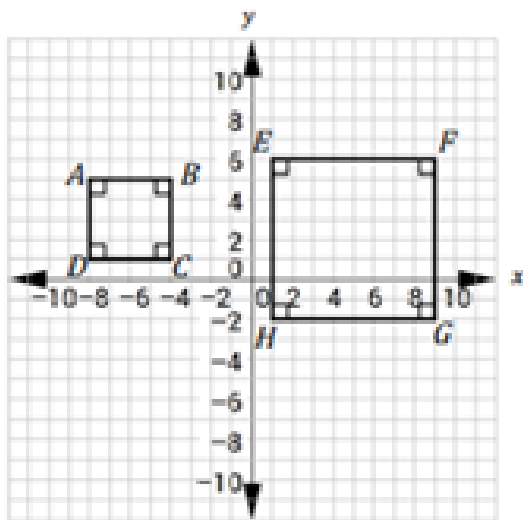


- \_\_\_\_\_ is the type of transformation that results in similar figures.
- Similarity preserves congruence of corresponding \_\_\_\_\_.
- Similarity maintains the proportionality of corresponding \_\_\_\_\_.

Congruent Triangles are \_\_\_\_\_ similar triangles.

Similar Triangles are \_\_\_\_\_ congruent triangles.



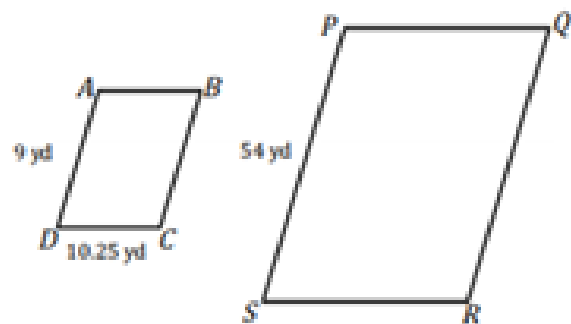
Based on the two similar squares above, name the properties of similar polygons, and give the justifications that prove the figures are similar.

#	Properties	Justifications
1.		
2.		
3.		
4.		

Each \_\_\_\_\_ side of a polygon can be multiplied by the \_\_\_\_\_ to get the length of its \_\_\_\_\_ side on a similar polygon. Then, the \_\_\_\_\_ of the \_\_\_\_\_ is the \_\_\_\_\_ of the \_\_\_\_\_ while the \_\_\_\_\_ of \_\_\_\_\_ is the \_\_\_\_\_.

**Example:**

Parallelograms ABCD and PQRS are similar.



a.) What is the scale factor from PQRS to ABCD?

b.) What is the length of  $\overline{RS}$ ?

**Example:**

Mrs. Kemp's rectangular garden has a length of 20 meters and a width of 15 meters. Her neighbor, Mr. Pippen, has a garden similar in shape with a scale factor of 3.

- a.) What is the width of Mr. Pippen's garden?
  
  
  
  
  
  
  
  
  
  
- b.) How do the areas of the gardens relate to one another?

Example:

area ratio  
 $a^2 \text{ & } b^2$

A right triangle has a base of 11 yards and a height of 7 yards. If you were to construct a similar but not congruent right triangle with area of 616 square yards, what would the dimensions of the new triangle be?

$$\begin{aligned} A &= \frac{1}{2}bh \\ &= \frac{1}{2}(11)(7) \\ &= 38.5 \text{ yd}^2 \end{aligned}$$

Example:

$$\begin{aligned} \frac{616}{38.5} &= \frac{\sqrt{16}}{\sqrt{1}} = \frac{a^2}{b^2} \\ &= \frac{4}{1} \end{aligned}$$

$$\begin{aligned} 11(4) &= 44 \text{ yd} \\ 7(4) &= 28 \text{ yd} \end{aligned}$$

The areas of two similar polygons are in the ratio of 25:81. Find the ratio for the corresponding sides.

$$\frac{\sqrt{25}}{\sqrt{81}} = \frac{a^2}{b^2}$$

$$\frac{5}{9}$$

**You try:**

Triangle  $\triangle TOY$  is similar to triangle  $\triangle GAL$ .  $\overline{TO}$  is 10 inches long,  $\overline{OY}$  is 6 inches long,  $\overline{GA}$  is 16 inches long, and  $\overline{GL}$  is 13.8 inches long. How long is  $\overline{TY}$ ?

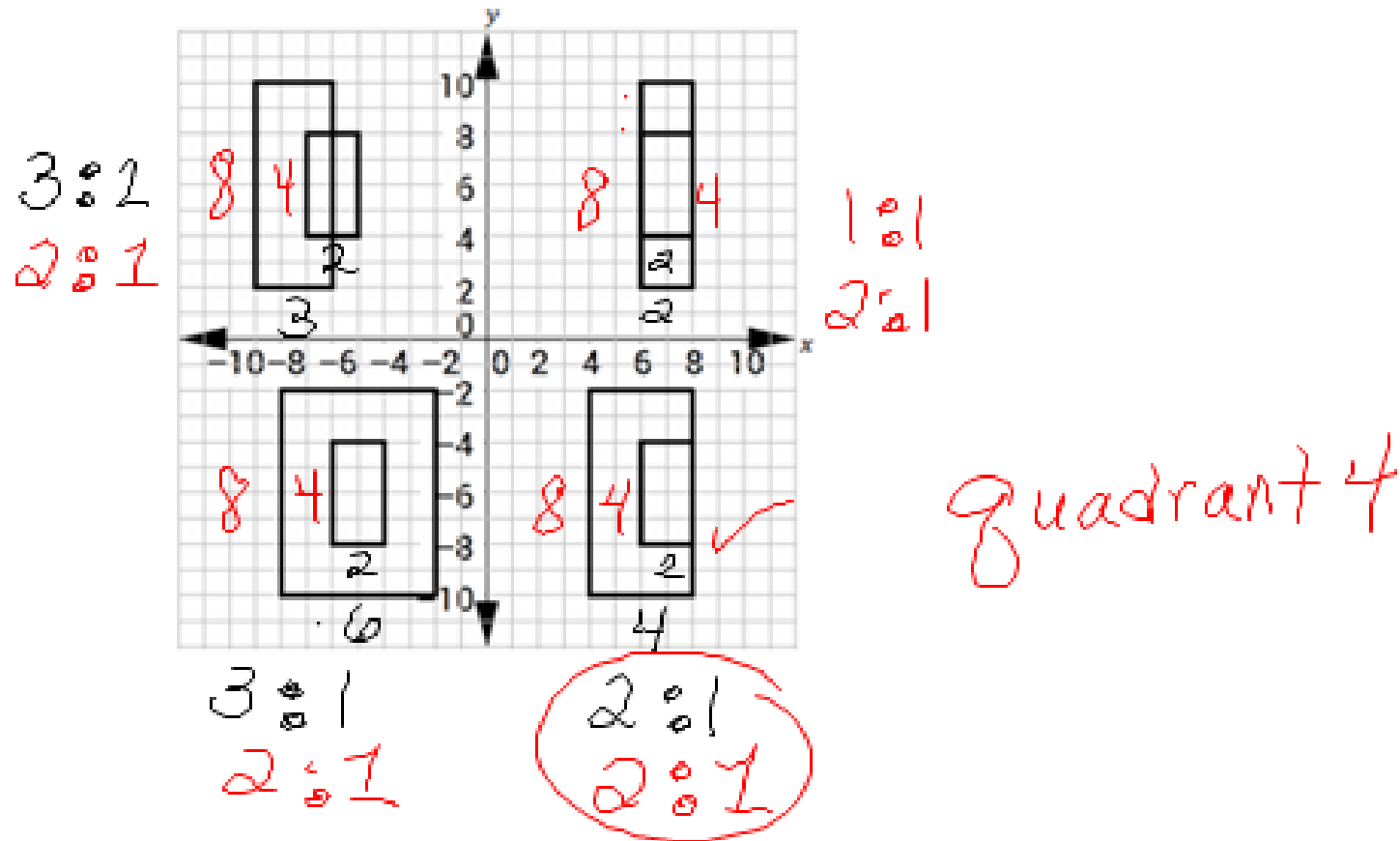
$$\frac{10}{16} = 0.625 \quad 13.8 (0.625) = 8.625$$

**You try:**

1. Which transformation would result in the perimeter of a polygon being different from the perimeter of its pre-image?

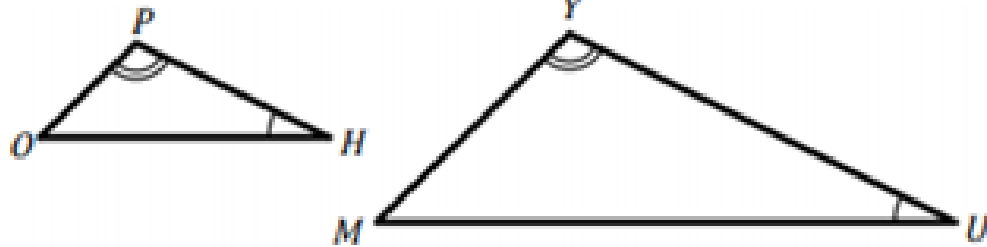
- A  $(x, y) \rightarrow (-x, -y)$
- B  $(x, y) \rightarrow (y, x)$
- C  $(x, y) \rightarrow (3x, 3y)$
- D  $(x, y) \rightarrow (x - 3, y + 1)$

2. Which quadrant has two similar polygons? Justify your answer.





$$\Delta PHO \sim \Delta YUM$$

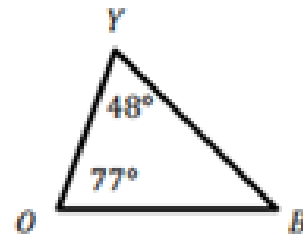
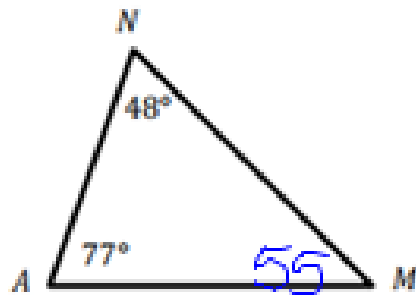


$\cong \Rightarrow$  congruent  
 $\sim \Rightarrow$  similar

List the corresponding sides and angles of the triangles above.

$$\begin{aligned} \angle P &\cong \angle Y \\ \angle H &\cong \angle U \\ \angle O &\cong \angle M \end{aligned}$$

$$\frac{PH}{YU} = \frac{HO}{UM} = \frac{PO}{YM}$$



Determine  $m\angle M$ .  $55^\circ$

Determine  $m\angle B$ .  $55^\circ$

$$\begin{array}{r} 77 \\ + 48 \\ \hline \end{array}$$

$$\begin{array}{r} 125 \\ 180 - 125 = 55 \end{array}$$