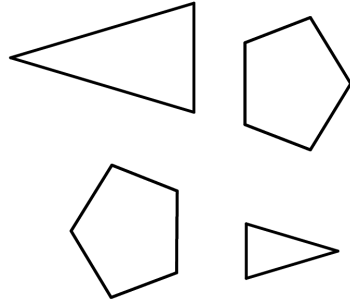


Section 5 – Topic 4
Congruence and Similarity of Polygons – Part 1

Consider the figures below.



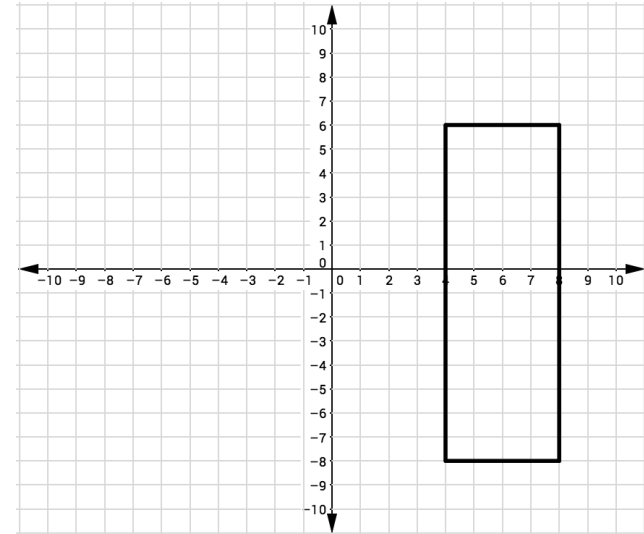
Explain which figures are congruent, if any.

Use observations from the figures above to state properties of congruent polygons.

- Congruent polygons have the same number of _____ and _____.
- Corresponding _____ of congruent polygons are congruent.
- Corresponding interior _____ of congruent polygons are congruent.

Let's Practice!

1. Which coordinates will produce a rectangle that is congruent to the one shown below?



- Ⓐ $(-2, -4), (0, -4), (-2, 14), (0, 14)$
- Ⓑ $(-6, -4), (-2, -4), (-6, 10), (-2, 10)$
- Ⓒ $(-6, -8), (0, -8), (-6, 4), (0, 4)$
- Ⓓ $(0, 0), (4, 0), (0, 10), (10, 4)$

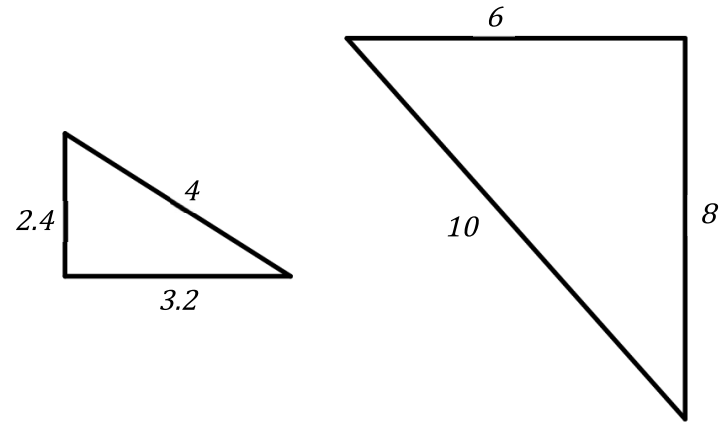
Try It!

2. Three of the angle measures of a quadrilateral that Romeo drew are 72° , 136° , and 110° . Juliet drew a quadrilateral that is congruent to Romeo's. Which of the following is one of the angle measures of Juliet's quadrilateral?

- (A) 42°
- (B) 52°
- (C) 70°
- (D) 108°

Similar Figures

Consider the following similar shapes.



Explain why you think that we classify these shapes as “similar” figures instead of congruent.

Use observations from the figures above to state properties of similar polygons.

- Similar polygons have the same number of _____ and _____.
- Corresponding interior _____ of similar polygons are congruent.
- Corresponding _____ of similar polygons are proportional.



2. 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.
- What is the width of Mr. Pippen's garden?
 - How do the areas of the gardens relate to one another?

**STUDY
EDGE
TIP**

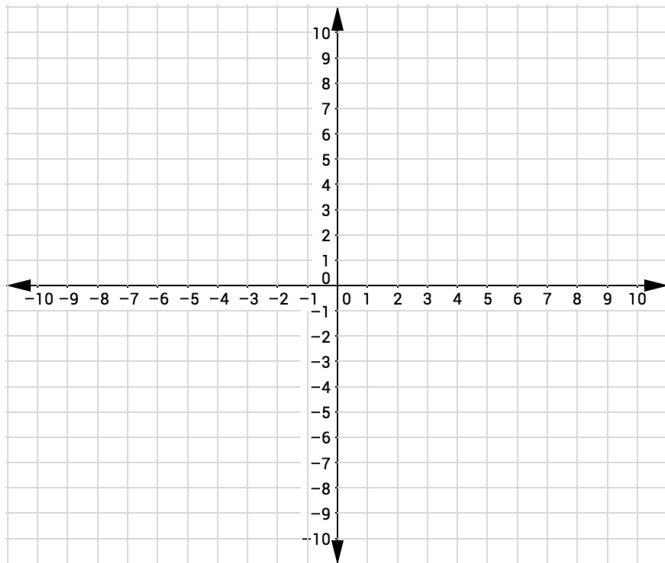
Each corresponding side of a polygon can be multiplied by the **scale factor** to get the length of its corresponding side on a similar polygon. Then, the ratio of the areas is the square of the scale factor while the ratio of perimeters is the scale factor.

Try It!

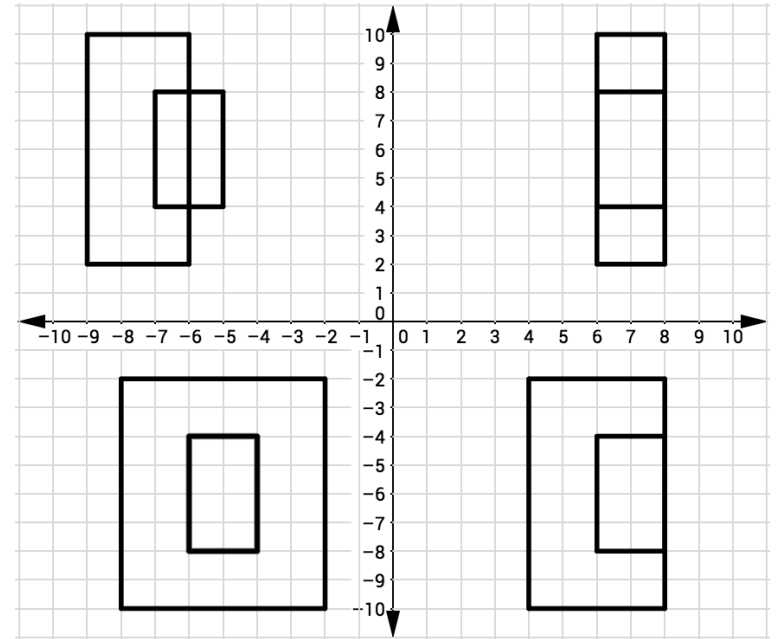
3. A right triangle has a base of 11 yards and a height of 7 yards. If you were to construct a similar but not congruent right triangle with area of 616 square yards, what would the dimensions of the new triangle be?
4. Triangle TOY is similar to triangle GAL . \overline{TO} is 10 inches long, \overline{OY} is 6 inches long, \overline{GA} is 16 inches long, and \overline{GL} is 13.8 inches long. How long is \overline{TY} ?



5. What conjectures can you make if two similar polygons have a similarity ratio of 1? Draw an example to justify your conjectures.



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



BEAT THE TEST!

- Which transformation would result in the perimeter of a polygon being different from the perimeter of its pre-image?
 - $(x, y) \rightarrow (-x, -y)$
 - $(x, y) \rightarrow (y, x)$
 - $(x, y) \rightarrow (3x, 3y)$
 - $(x, y) \rightarrow (x - 3, y + 1)$
- The areas of two similar polygons are in the ratio 25:81. Find the ratio of the corresponding sides.
- In triangle ABC , angle $A = 90^\circ$ and angle $B = 35^\circ$. In triangle DEF , angle $E = 35^\circ$ and angle $F = 55^\circ$. Are the triangles similar? Prove your answer.
- Four of the angle measures of a pentagon that Kym drew are $100^\circ, 120^\circ, 120^\circ,$ and 140° . Her brother drew a pentagon that was congruent to Kym's. Which answer below represents one of the angle measures of her brother's pentagon?
 - 30°
 - 42°
 - 60°
 - 160°

