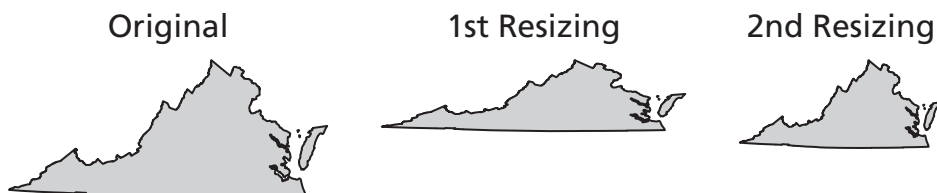


8.1 Start Thinking

A map of the state of Virginia is inserted into a research paper on the Civil War. The clip art is not the correct size, so the student tries to adjust the sizing. Review the diagrams below and discuss how the three are related. Would you say the two resized figures are “similar” to the original?



8.1 Warm Up

Solve the proportion.

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

2. $\frac{12}{x} = \frac{3}{5}$

3. $\frac{x}{9} = \frac{1}{x}$

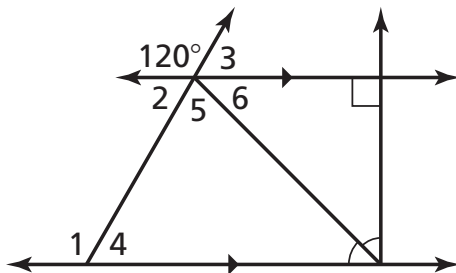
4. $\frac{x+3}{2} = \frac{3}{5}$

5. $\frac{4-x}{12} = \frac{3}{-7}$

6. $\frac{1}{2x+1} = \frac{x-3}{9}$

8.1 Cumulative Review Warm Up

Use the diagram to find the measure of the angle.



1. $\angle 1$

2. $\angle 2$

3. $\angle 3$

4. $\angle 4$

5. $\angle 5$

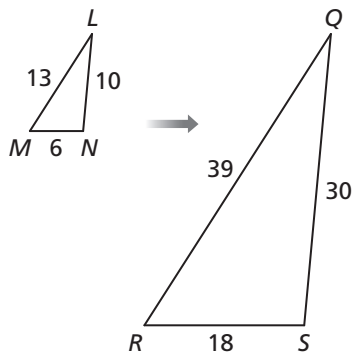
6. $\angle 6$

8.1

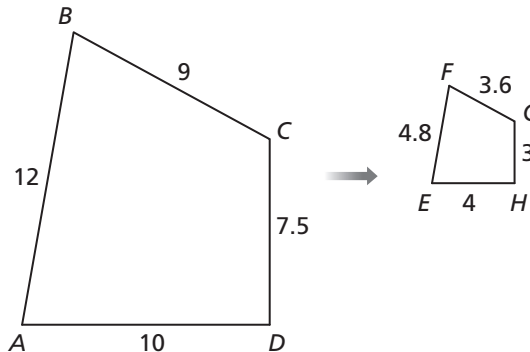
Practice A

In Exercises 1 and 2, find the scale factor. Then list all pairs of congruent angles and write the ratios of the corresponding side lengths in a statement of proportionality.

1. $\triangle LMN \sim \triangle QRS$

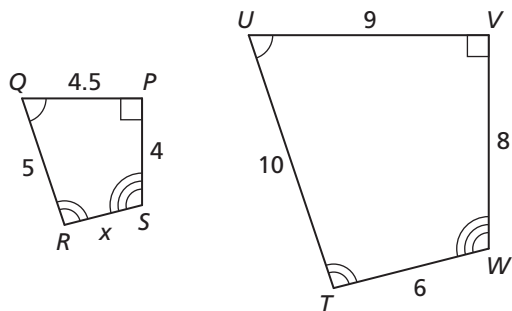


2. $ABCD \sim EFGH$

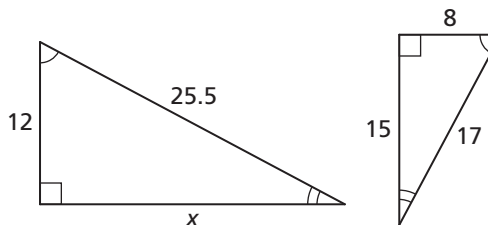


In Exercises 3 and 4, the polygons are similar. Find the value of x .

3.

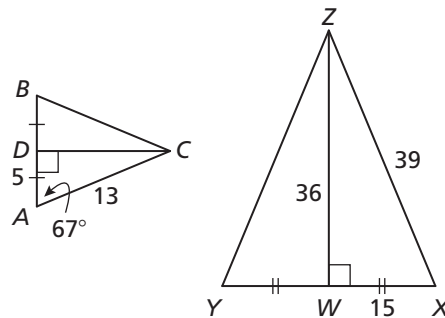


4.

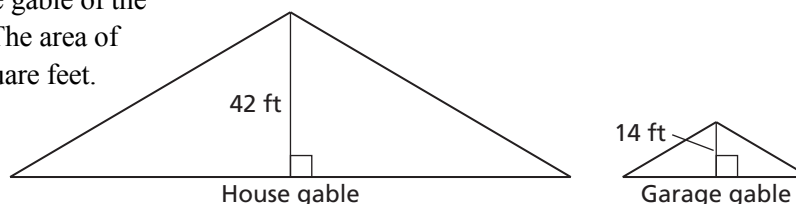


In Exercises 5–11, $\triangle ABC \sim \triangle XYZ$.

5. Find the scale factor of $\triangle ABC$ to $\triangle XYZ$.
6. Find $m\angle X$.
7. Find CD .
8. Find the area of $\triangle ABC$. Then find the area of $\triangle XYZ$.
9. Find the ratio of the area of $\triangle ABC$ to the area of $\triangle XYZ$.
10. Find BC and YZ . Explain your reasoning.
11. Find the ratio of the perimeter of $\triangle ABC$ to the perimeter of $\triangle XYZ$.



12. You are building a roof on a garage such that the gable of the house is similar to the gable of the garage as shown in the diagram. The area of the gable on the house is 3024 square feet. Find the area of the gable on the garage.

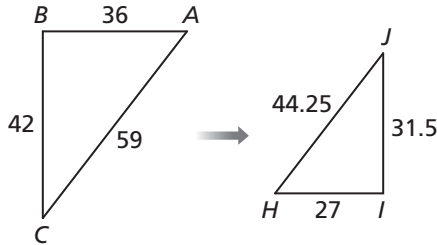


8.1

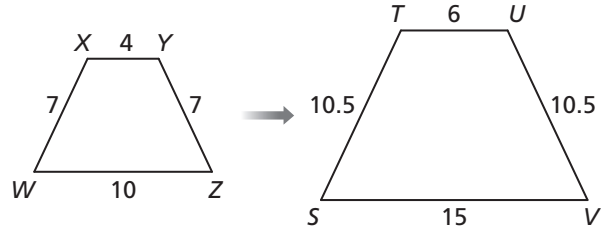
Practice B

In Exercises 1 and 2, find the scale factor. Then list all pairs of congruent angles and write the ratios of the corresponding side lengths in a statement of proportionality.

1. $\triangle ABC \sim \triangle HIJ$

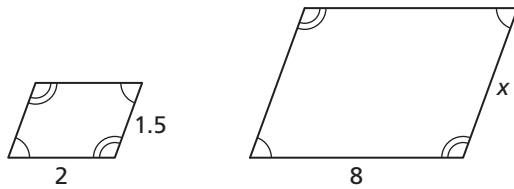


2. $WXYZ \sim STUV$

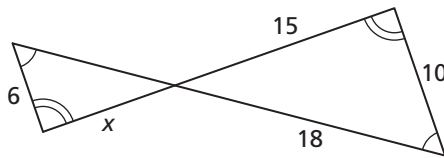


In Exercises 3 and 4, the polygons are similar. Find the value of x .

3.



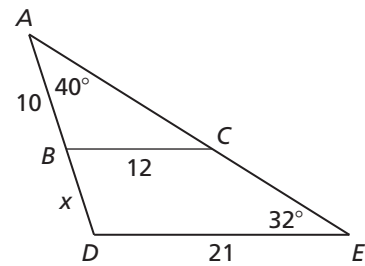
4.



In Exercises 5 and 6, the figures are similar. Find the missing corresponding side length.

5. Figure A has a perimeter of 60 inches and one of the side lengths is 5 inches.
Figure B has a perimeter of 84 inches.
6. Figure A has an area of 4928 square feet and one of the side lengths is 88 feet.
Figure B has an area of 77 square feet.
7. In the diagram, $\triangle ABC \sim \triangle ADE$.

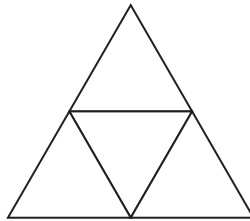
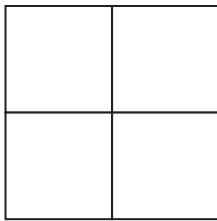
- a. Find the scale factor from $\triangle ABC$ to $\triangle ADE$.
- b. Find the value of x .
- c. Find $m\angle ABC$.
- d. The perimeter of $\triangle ABC$ is about 42.4 units.
Find the perimeter of the $\triangle ADE$.
- e. The area of $\triangle ABC$ is about 71.75 square units.
Find the area of the $\triangle ADE$.
- f. Is $\overline{BC} \parallel \overline{DE}$? Explain your reasoning.



8.1 Enrichment and Extension

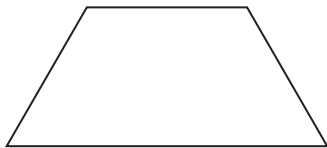
Rep-Tiles and Rep- n Tiles

A figure is called a *rep-tile* if copies of the figure fit together to form a larger similar figure. The figures below are examples of rep-tiles, where four equal figures fit together to form a larger similar figure. Notice the larger square and the four equal squares inside it. Likewise, the equilateral triangle has four equilateral triangles inside of it. The inner figures are all similar to the outer figures.

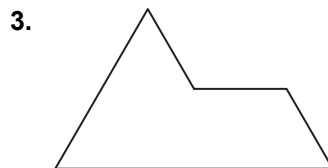
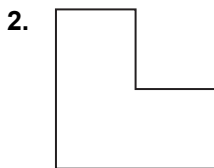


Because these two figures each have four replicas within the larger figure, they are classified more specifically as a rep-4 tile.

1. Draw four smaller, congruent figures inside the trapezoid below. The figures must be similar to the original figure.



Create a rep-9 tile, or a rep-tile of nine congruent figures similar to the original figure.





Puzzle Time

What Did One Elevator Say To The Other Elevator?

A	B	C	D	E	F
G	H	I			

Complete each exercise. Find the answer in the answer column. Write the word under the answer in the box containing the exercise letter.

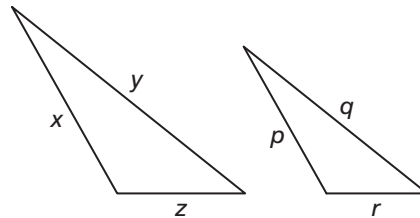
120 MOUSE
square AM
side UP
40 SOMETHING
equal I
36 AND
corresponding THINK
100 WITH
similar GOING

Complete the sentence.

- A. A similarity transformation preserves _____ measure.
- B. A similarity transformation also enlarges or reduces side lengths by a _____ factor k .
- C. If two polygons are similar, then the ratio of any two _____ lengths in the polygons is equal to the scale factor of the similar polygons.
- D. If two polygons are similar, then the ratio of their perimeters is _____ to the ratios of their corresponding side lengths.
- E. If two polygons are similar, then the ratio of their areas is equal to the _____ of the ratios of their corresponding side lengths.

Triangles XYZ and PQR are similar. Find the indicated value.

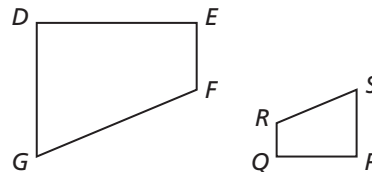
- F. $p = 15, q = 21, r = 9,$
 $x = 20, z = 12;$ Find y .



- G. What is k , the scale factor for Exercise F?

Polygons $DEFG$ and $PQRS$ are similar. Find the indicated value.

- H. The perimeter of the smaller polygon is 60 inches, and the ratio of the side lengths is $\frac{3}{5}$. Find the perimeter of the larger polygon.



- I. The perimeter of the larger polygon is 280 inches, and the ratio of the side lengths is $\frac{1}{7}$. Find the perimeter of the smaller polygon.

28 COMING
areas AIR
21 WRONG
$\frac{3}{4}$ DOWN
equal HIGH
scale I
70 RED
$\frac{1}{4}$ FAST
angle HEY