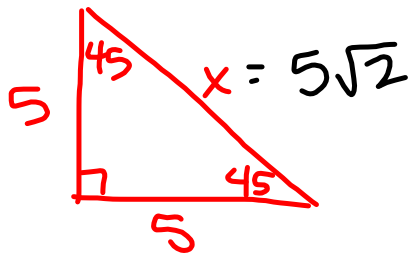
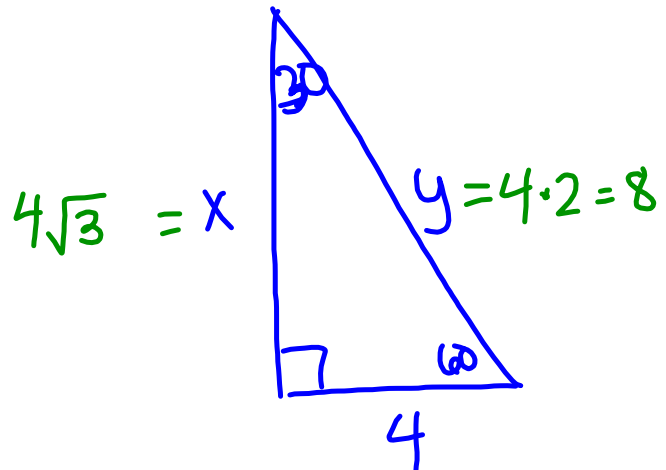
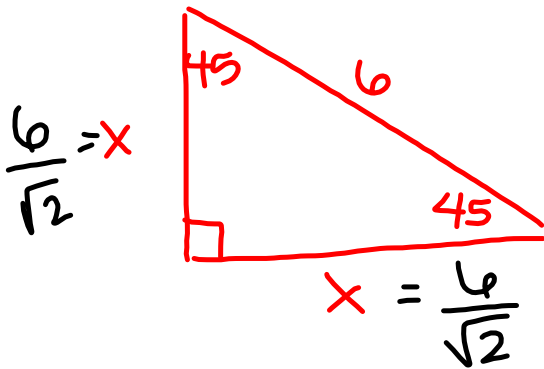


# Questions on Special Right Triangles?

We will be taking our content mastery quiz soon!



side length  $\rightarrow$  hypotenuse  
 • by  $\sqrt{2}$

hypotenuse  $\rightarrow$  side length  
 $\div$  by  $\sqrt{2}$

$$\frac{6}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{6\sqrt{2}}{\sqrt{2}} = 3\sqrt{2}$$

shorter leg  $\rightarrow$  hypotenuse  
 • by 2

hypotenuse  $\rightarrow$  shorter leg  
 $\div$  by 2

shorter leg  $\rightarrow$  longer leg  
 • by  $\sqrt{3}$

longer leg  $\rightarrow$  shorter leg  
 $\div$  by  $\sqrt{3}$

## Big and Small

### Dilating Triangles to Create Similar Triangles

4.1

Ch 4

pg 257-332

NOT IN YOUR BOOK, WRITE IN YOUR NOTES

write on pg 260

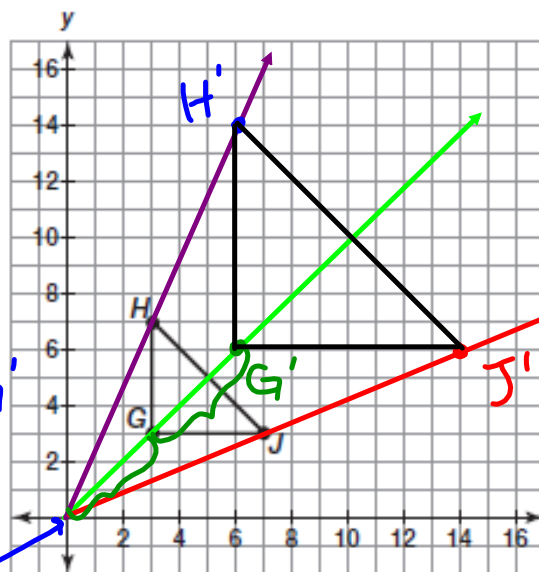
A **dilation** is a transformation that produces an image that is the same shape as the original, but is a different size. A dilation stretches or shrinks the original figure. The description of a dilation includes the scale factor (or ratio) and the center of the dilation.

PG.266 IN YOUR BOOK

You can use your ~~compass~~ and a straightedge to perform a dilation. Consider  $\triangle GHJ$  shown on the coordinate plane. You will dilate the triangle by using the origin as the center and by using a scale factor of 2.

(0,0)

- How will the distance from the center of dilation to a point on the image of  $\triangle G'H'J'$  compare to the distance from the center of dilation to a corresponding point on  $\triangle GHJ$ ? Explain your reasoning.



Distance is twice as much  $[(0,0) \rightarrow G]$  is  $2 \times [(0,0) \rightarrow G]$   
 (0,0) Origin

$\triangle GHJ$  pre-image  
 $\triangle G'H'J'$  image

- For each vertex of  $\triangle GHJ$ , draw a ray that starts at the origin and passes through the vertex.
- Use the duplicate segment construction to locate the vertices of  $\triangle G'H'J'$ .
- List the coordinates of the vertices of  $\triangle GHJ$  and  $\triangle G'H'J'$ . How do the coordinates of the image compare to the coordinates of the pre-image?

$G(3,3) \rightarrow G'(6,6)$   
 $H(3,7) \rightarrow H'(6,14)$   
 $J(7,3) \rightarrow J'(14,6)$

Coordinates in the image are twice as much as the coordinates in the pre-image.

## PG.267 IN YOUR BOOK

5. Triangle  $J'K'L'$  is a dilation of  $\triangle JKL$ . The center of dilation is the origin.



- a. List the coordinates of the vertices of  $\triangle JKL$  and  $\triangle J'K'L'$ . How do the coordinates of the image compare to the coordinates of the pre-image?

$$\begin{array}{l} J'(5,2) \\ K'(4,3) \\ L'(6,5) \end{array} \left. \begin{array}{l} \leftarrow \\ \leftarrow \\ \leftarrow \end{array} \right\} \begin{array}{l} J(10,4) \\ K(8,6) \\ L(12,10) \end{array}$$

- b. What is the scale factor of the dilation? Explain your reasoning.

$$\frac{1}{2}$$

- c. How do you think you can use the scale factor to determine the coordinates of the vertices of an image?

Multiply coordinates of pre-image by the scale factor to get the coordinates of the image.

6. Use coordinate notation to describe the dilation of point  $(x, y)$  when the center of dilation is at the origin using a scale factor of  $k$ .

$$\begin{array}{l} \text{pre-image} \\ (x, y) \end{array} \longrightarrow \begin{array}{l} \text{image} \\ (kx, ky) \end{array}$$

## NOT IN YOUR BOOK

1. Use quadrilateral  $ABCD$  shown on the grid to complete part (a) through part (c).

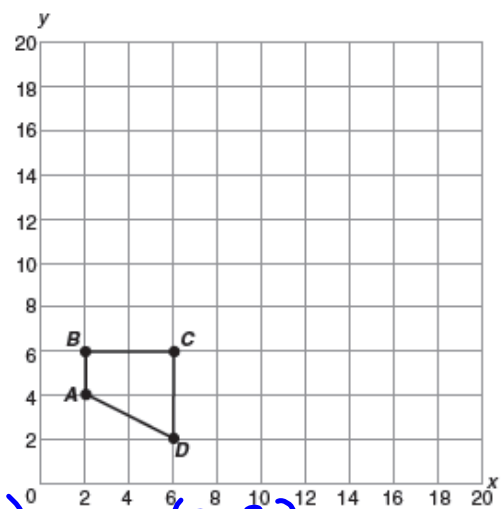
- a. On the grid, draw the image of quadrilateral  $ABCD$  dilated using a scale factor of 3 with the center of dilation at the origin. Label the image  $JKLM$ .

$$\begin{aligned} A &\rightarrow J(6, 12) \\ B &\rightarrow K(6, 18) \\ C &\rightarrow L(18, 18) \\ D &\rightarrow M(18, 6) \end{aligned}$$

- b. On the grid, draw the image of quadrilateral  $ABCD$  dilated using a scale factor of 0.5 with the center of dilation at the origin. Label the image  $WXYZ$ .

$$\begin{aligned} A(2, 4) &\rightarrow W(1, 2) & C(6, 6) &\rightarrow Y(3, 3) \\ B(2, 6) &\rightarrow X(1, 3) & D(6, 2) &\rightarrow Z(3, 1) \end{aligned}$$

- c. Identify the coordinates of the vertices of quadrilaterals  $JKLM$  and  $WXYZ$ .

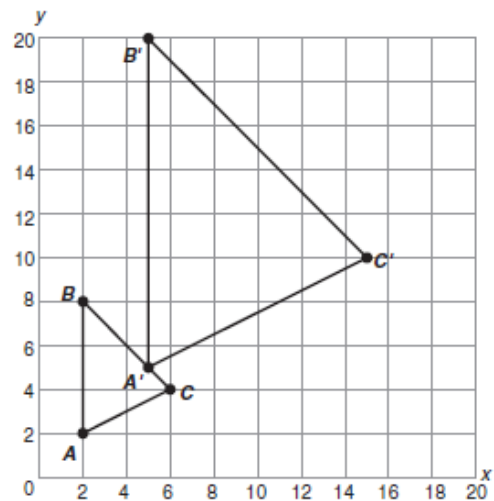


## NOT IN YOUR BOOK

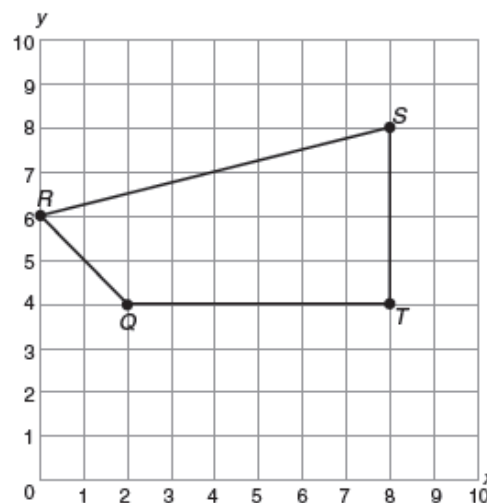
2. The vertices of triangle  $ABC$  are  $A(-6, 15)$ ,  $B(0, 5)$ , and  $C(3, 10)$ . Without drawing the figure, determine the coordinates of the vertices of the image of triangle  $ABC$  dilated using a scale factor of  $\frac{1}{3}$  with the center of dilation at the origin. Explain your reasoning.

3. The vertices of trapezoid  $WXYZ$  are  $W(-1, 2)$ ,  $X(-3, -1)$ ,  $Y(5, -1)$ , and  $Z(3, 2)$ . Without drawing the figure, determine the coordinates of the vertices of the image of trapezoid  $WXYZ$  dilated using a scale factor of 5 with the center of dilation at the origin. Explain your reasoning.

5. Triangle  $A'B'C'$  is a dilation of  $\triangle ABC$  with the center of dilation at the origin. List the coordinates of the vertices of  $\triangle ABC$  and  $\triangle A'B'C'$ . What is the scale factor of the dilation? Explain.



6. On the grid, draw the image of quadrilateral  $QRST$  using the dilation  $(x, y) \rightarrow (0.75x, 0.75y)$ . Label the image  $Q'R'S'T'$ .

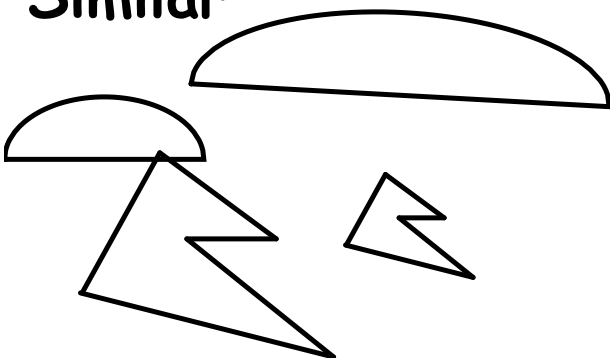


NOT IN YOUR BOOK, WRITE IN NOTES!

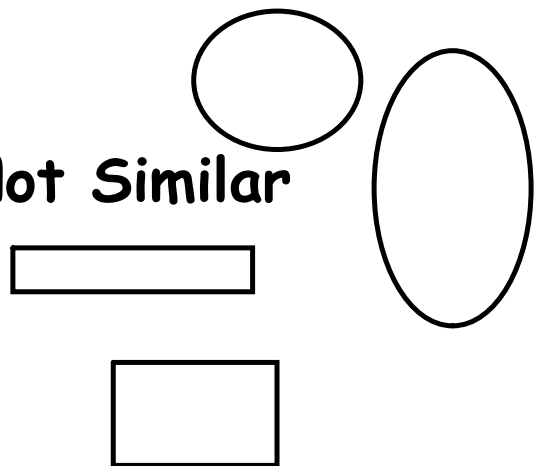
**Similar figures** are figures that are ~~be~~ formed by taking the original figure, called the **pre-image**, and performing a series of transformations (rotations, <sup>reflections</sup> translations, dilations) to get a new figure, called the **image**.

Similar figures have the same shape, but can have different sizes.

**Similar**



**Not Similar**



# Homework

## Finish 4.1