

Chapter 8 Review

Vocabulary Review

angle of rotation (p. 265)
center of rotation (p. 265)
dilation (p. 277)
enlargement (p. 278)
image (p. 254)

line of reflection (p. 259)
line of symmetry (p. 260)
reduction (p. 278)
reflection (p. 259)
reflectional symmetry (p. 260)

rotation (p. 265)
rotational symmetry (p. 265)
scale factor (p. 278)
transformation (p. 254)
translation (p. 254)

Choose the correct vocabulary term(s) above to complete each sentence.

1. A(n) ? is a dilation with a scale factor less than one.
2. Three types of transformations that change the position of a figure are ?, ?, and ?.
3. If a figure has a(n) ? of 180° or less for which its image matches the original figure, then the figure has ?.
4. If a figure has a(n) ? that divides the figure into two mirror images, then the figure has ?.
5. A ? is a transformation that can change the size of a figure.

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Skills and Concepts

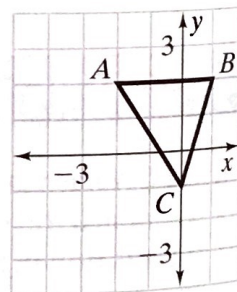
Lessons 8-1, 8-2, 8-3

- To graph and describe translations in the coordinate plane
- To graph reflections in the coordinate plane and to identify lines of symmetry
- To graph rotations and to identify rotational symmetry

A **transformation** is a change in the position, shape, or size of a figure. The figure you get after a transformation is called the **image**. You can transform figures in a plane by a **translation**, a **reflection**, or a **rotation**.

Copy $\triangle ABC$ for Exercises 6–8. Graph the image of $\triangle ABC$ after each transformation.

6. translation 2 units left and 1 unit up
7. translation 1 unit right and 3 units down
8. reflection over the x -axis
9. reflection over the y -axis
10. rotation of 90° about the origin
11. rotation of 180° about the origin

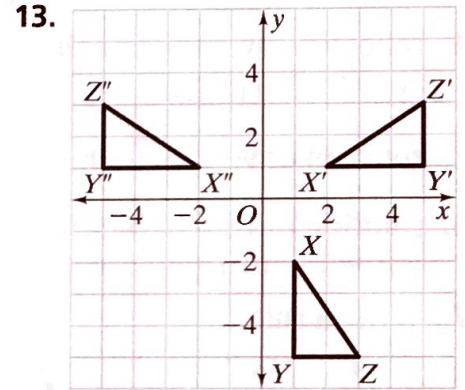
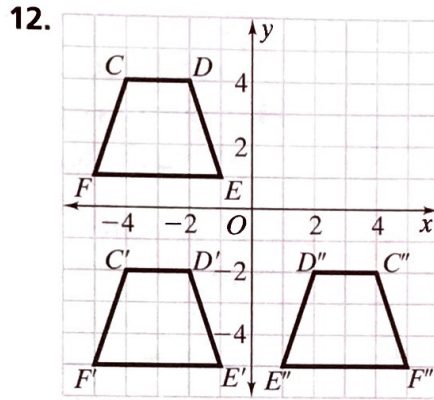


Lesson 8-4

- To describe a sequence of transformations that maps one figure onto another
- To determine whether two figures are congruent by using a sequence of transformations

If two figures are congruent, then a transformation, or a sequence of transformations, will map one figure onto the other. If you can use a sequence of transformations to map one figure onto another, then the two figures are congruent.

The three figures in each diagram are congruent. Describe the sequence of transformations that maps the original figure onto the final image.



Lesson 8-5

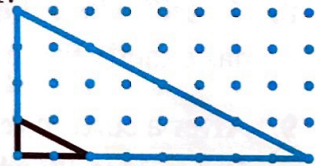
- To graph dilations and to determine the scale factor of a dilation

A **dilation** is a transformation in which a figure and its image are similar. Every dilation has a center and a scale factor. The **scale factor** describes the change in size from the original figure to the image.

A dilation is an **enlargement** if the scale factor is greater than 1.

A dilation is a **reduction** if the scale factor is less than 1.

14. The blue figure is a dilation of the original figure. Find the scale factor and classify the dilation as an *enlargement* or a *reduction*.

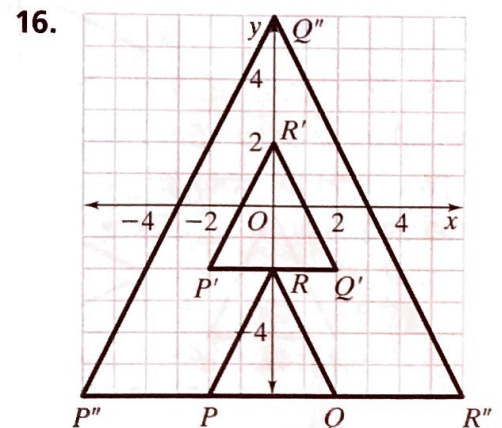
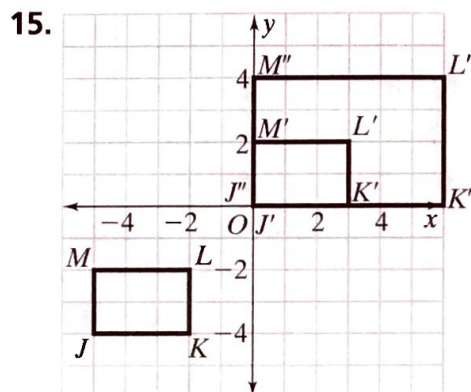


Lesson 8-6

- To describe a sequence of transformations that maps one figure onto a figure that is similar
- To determine whether two figures are similar by using a sequence of transformations

If two figures are similar, but not congruent, then a dilation, or a dilation and a sequence of transformations, will map one figure onto the other. If you can use a sequence of transformations and a dilation to map one figure onto another, then the two figures are similar.

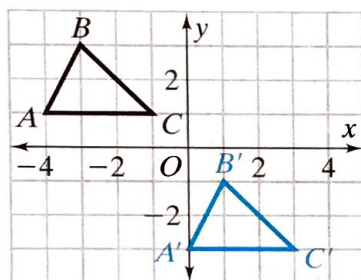
The three figures in each diagram are similar. Describe the sequence of transformations that maps the original figure onto the final image.



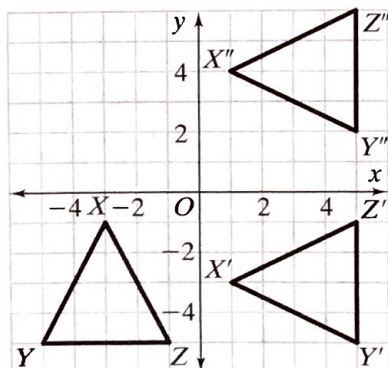
$\triangle JKL$ has vertices $J(4, 5)$, $K(6, 2)$, and $L(3, 2)$. Graph $\triangle JKL$ and its image after each transformation.

- translation 6 units left
- translation 3 units left and 3 units down
- reflection over the y -axis
- reflection over the line through $(1, -2)$ and $(1, 2)$
- rotation of 90° about the origin
- rotation of 180° about the origin

- Write a rule to describe the translation at the right.

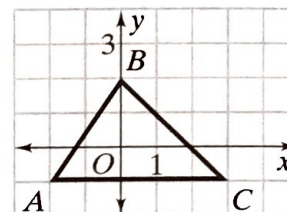


- Open-Ended** Draw and describe a figure that has exactly three lines of symmetry.
- After a certain reflection, the image of $P(3, -1)$ is $P'(-1, -1)$. What are the coordinates of the image of $Q(-2, 4)$ after the same reflection?
- The three figures in the diagram are congruent. Describe the sequence of transformations that maps the original figure onto the final image.

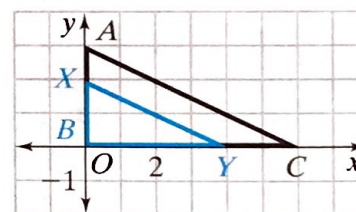


- $\triangle ABC$ has vertices $A(1, 2)$, $B(4, 3)$ and $C(-2, 5)$. Find the coordinates of the image of $\triangle ABC$ after a dilation with a scale factor of 3.

- Writing in Math** Suppose you know the coordinates of the vertices of a triangle. Explain how you would find the coordinates of the vertices of its image after a dilation with a scale factor of r .
- Copy $\triangle ABC$ below. Draw the image of $\triangle ABC$ after a dilation with a scale factor of 2.



- In the figure below, $\triangle XBY$ is the image of $\triangle ABC$ after a dilation. What is the scale factor?



- The three figures in the diagram are similar. Describe the sequence of transformations that maps the original figure onto the final image.

