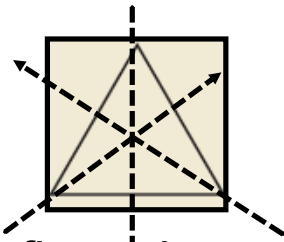


Bellwork

03/02/2012

How many lines of symmetry does each figure have?

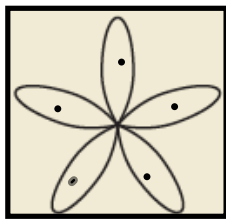
1. Equilateral triangle



3

Does the figure have rotational symmetry? If so, describe the rotations that map the figure onto itself.

2.



$$\frac{360}{5} = 72$$

$72^\circ, 144^\circ$

Geometry
9.7 Identify and Perform Dilations
Standard(s): 3, 10

Vocabulary:

Scalar Multiplication: The process of multiplying each element of a matrix by a real number or *scalar*.

Note: You can use scalar multiplication to represent a dilation centered at the origin in the coordinate plane.

Dilation
enlargement \rightarrow factor > 1

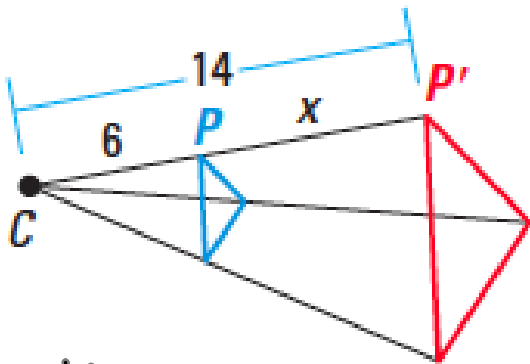
reduction \rightarrow factor < 1

Scale factor:

$$\frac{\text{final}}{\text{original}}$$

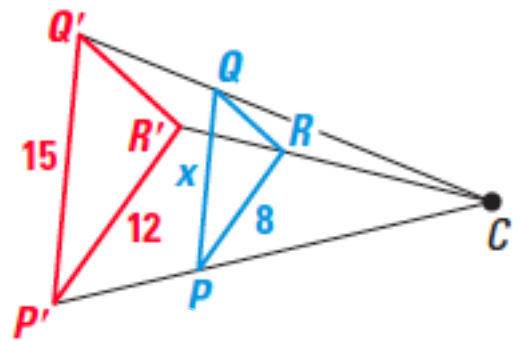
Identifying Dilations

Find the scale factor. Tell whether the dilation is *reduction* or *enlargement*. Find the value of x .



$$\frac{14}{6} = \frac{7}{3}$$

Enlargement
 $x = 8$



$$\frac{12}{8} = \frac{3}{2}$$

Enlargement

$$\frac{3}{2} = \frac{15}{x}$$

$$3x = 30$$

$$x = 10$$

Scalar Multiplication

Simplify the product.

$$2 \begin{bmatrix} -4 & 3 & -2 \\ 1 & 7 & 0 \end{bmatrix}$$

$$\begin{bmatrix} -8 & 6 & -4 \\ 2 & 14 & 0 \end{bmatrix}$$

$$\begin{matrix} 2 \\ 3 \end{matrix} \begin{bmatrix} 6 & -9 & 0 \\ 12 & 4.5 & -6 \end{bmatrix}$$

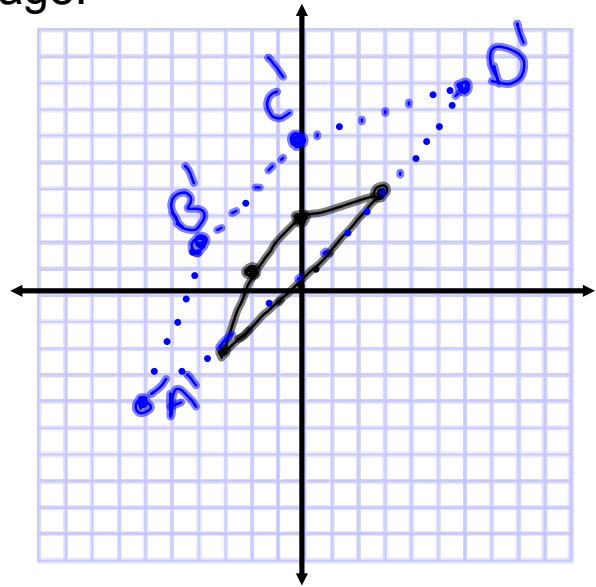
$$\begin{bmatrix} 4 & -6 & 0 \\ 8 & 3 & -4 \end{bmatrix}$$

Dilations with Matrices

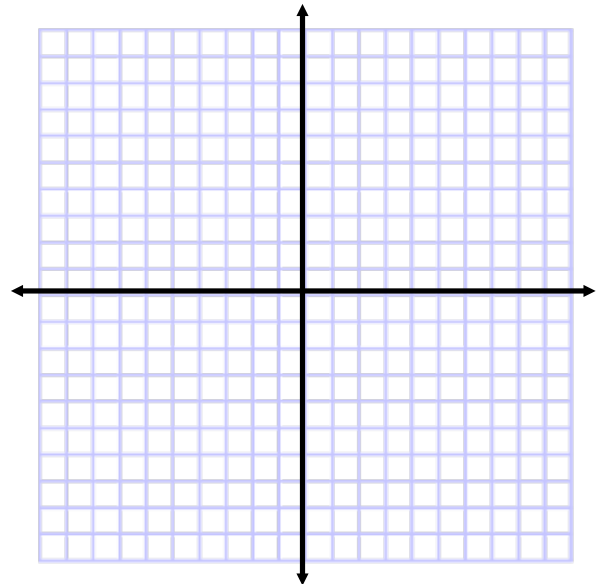
Find the image matrix that represents a dilation of the polygon centered at the origin with the given scale factor. Then graph the polygon and its image.

$$\begin{matrix} A & B & C & D \\ \begin{bmatrix} -3 & -2 & 0 & 3 \\ -2 & 1 & 3 & 4 \end{bmatrix} & ;k=2 \end{matrix}$$

$$\begin{matrix} A' & B' & C' & D' \\ \begin{bmatrix} -6 & -4 & 0 & 6 \\ -4 & 2 & 6 & 8 \end{bmatrix} \end{matrix}$$



$$\begin{matrix} G & H & J \\ \begin{bmatrix} -2 & 0 & 6 \\ -4 & 2 & -2 \end{bmatrix} & ;k=\frac{1}{2} \end{matrix}$$

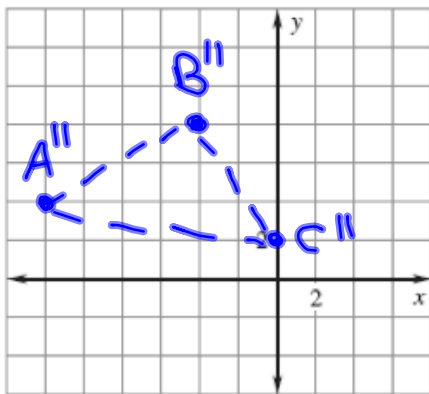


Compositions with Dilation

The vertices of $\triangle ABC$ are $A(1,2)$, $B(5,4)$, and $C(7,1)$. Graph the image of the triangle after a composition of the transformations in the order they are listed.

Translation: $(x,y) \rightarrow (x-7,y)$

Dilation: centered at the origin with a scale factor of 2



$$A'(-6, 2)$$

$$B'(-2, 4)$$

$$C'(0, 1)$$

$$A''(-12, 4)$$

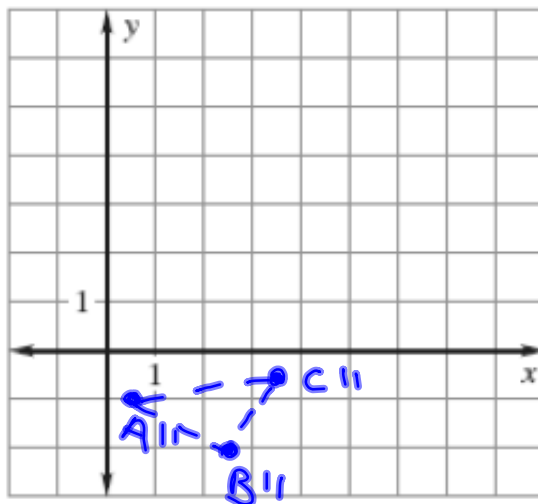
$$B''(-4, 8)$$

$$C''(0, 2)$$

$A(1,2)$, $B(5,4)$, and $C(7,1)$

Dilation: centered at the origin with a scale factor of $\frac{1}{2}$

Reflection: in the x-axis



$$A'(\frac{1}{2}, 1)$$

$$B'(\frac{5}{2}, 2)$$

$$C'(\frac{7}{2}, \frac{1}{2})$$

$$A''(\frac{1}{2}, -1)$$

$$B''(\frac{5}{2}, -2)$$

$$C''(\frac{7}{2}, -\frac{1}{2})$$

Homework Assignment

Worksheet 9.7B

