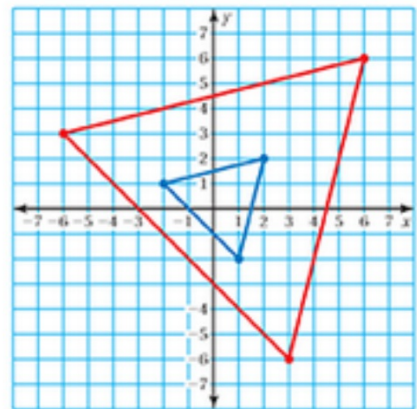


2.7 Dilations

Enlarge or Reduce a figure in the Coordinate Plane

Learning Targets

- Identify a Dilation
- Find and Use Scale Factor

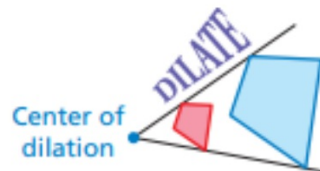


Pick up Notes
on the front table.

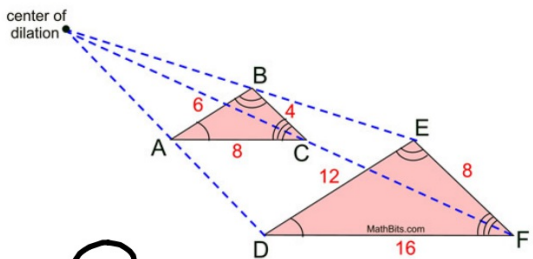
2.7 Dilations

Enlarge or Reduce a figure in the Coordinate Plane

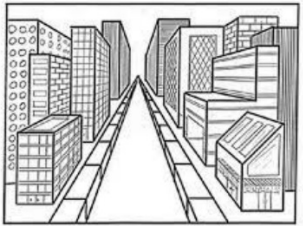
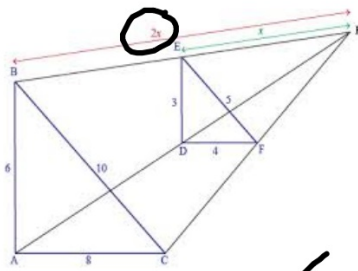
A **dilation** is a transformation in which a figure is made larger or smaller with respect to a point called the **center of dilation**.



$(0,0)$
origin



2



✓



A **Dilation** is another transformation (translation, reflection, rotation)

The Meaning of a Word ● Dilate

When you have your eyes checked, the optometrist sometimes

dilates one or both of the pupils of your eyes.



**Larger
Enlargement**

Describe the change in the measurement

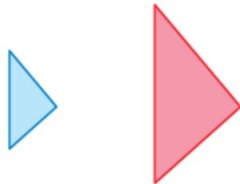


**Smaller
Reduction**

Identify a Dilation

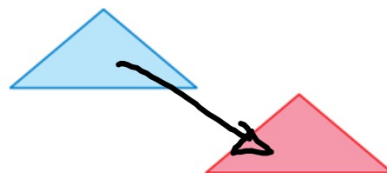
Tell whether the blue figure is a dilation of the red figure.

a.



Yes

b.



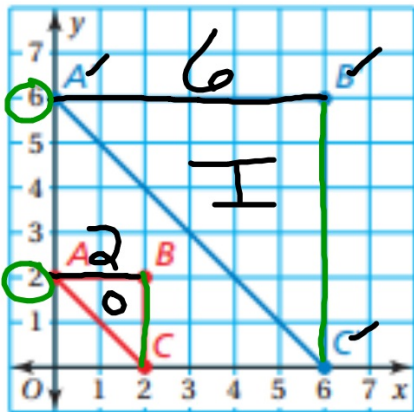
No

Translation

Scale Factor k

$$y = kx$$

The **RATIO** of the side length of the Image to the corresponding side length of the Original.



$k = \text{scale factor}$
Enlargement

$$k = 3$$

Using Scale Factor to Dilate a Figure

RULE

To Dilate a figure with respect to the origin,
Multiply the coordinates of each vertex
by the **Scale Factor k**

$$(x, y) \rightarrow (kx, ky)$$

$$(x, y) \longrightarrow (kx, ky)$$

Enlargement *Multiply by #s greater than 1*

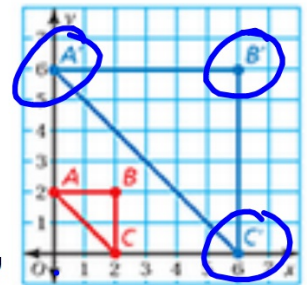
$$A(4, 6) \longrightarrow A'(8, 12) \quad k=2$$

$$(x, y) \longrightarrow (kx, ky)$$

Reduction *Multiply by #s between 0 and 1*

$$B(4, 6) \longrightarrow B'(2, 3) \quad k=0.5$$

Using Scale Factor



To Dilate a figure with respect to the origin,
Multiply the coordinates for each vertex by the
Scale Factor k

RULE

(x, y)

(kx, ky)

$k = 3$

A (0, 2)

B(2, 2)

C(2, 0)

A' (0, 6)

B' (6, 6)

C' (6, 0)

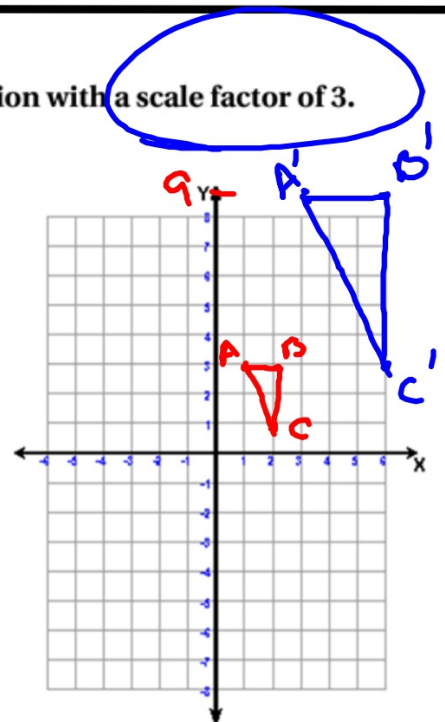
Dilating a Figure

Draw the image of Triangle ABC after a dilation with a scale factor of 3. Identify the type of dilation.

Multiply each x - and y -coordinate by the scale factor 3.

Vertices of ABC	$\times 3$	Vertices of $A'B'C'$
$A(1, 3)$	$A'(3, 9)$	<input type="text"/>
$B(2, 3)$	$B'(6, 9)$	
$C(2, 1)$	$C'(6, 3)$	

$A'(3 \cdot 1, 3 \cdot 3)$

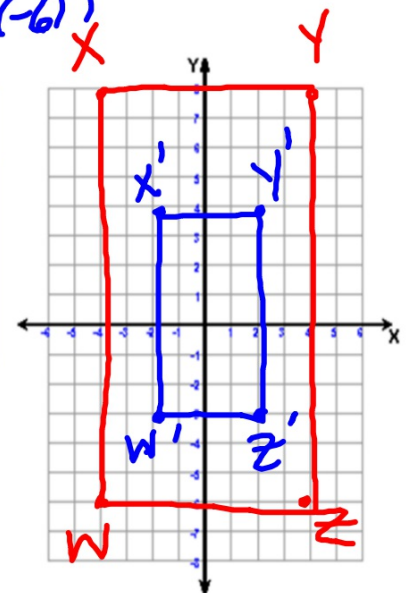


Dilating a Figure

Draw the image of Rectangle $WXYZ$ after a dilation with a scale factor of 0.5. Identify the type of dilation.

Multiply each x y -coordinate by the scale factor 0.5.

Vertices of $WXYZ$	$(0.5x, 0.5y)$	Vertices of $W'X'Y'Z'$
$W(-4, -6)$	$W'(-2, -3)$	
$X(-4, 8)$	$X'(-2, 4)$	
$Y(4, 8)$	$Y'(2, 4)$	
$Z(4, -6)$	$Z'(2, -3)$	



$$0.5 \text{ or } \frac{1}{2} \div 2$$

$$\frac{1}{3} \div 3$$

$$0.25 \text{ or } \frac{1}{4} \div 4$$

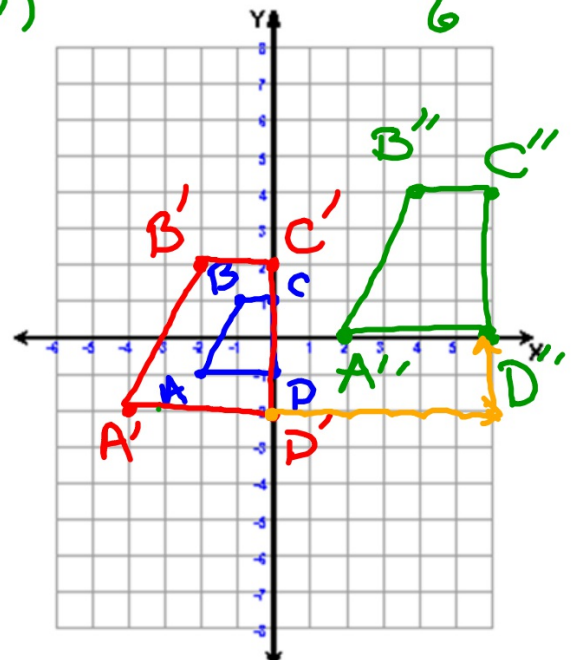
Using More Than One Transformation

The vertices of a trapezoid are $A(-2, -1)$, $B(-1, 1)$, $C(0, 1)$, and $D(0, -1)$. Dilate the trapezoid with respect to the origin using a scale factor of 2. Then translate it 6 units right and 2 units up. What are the coordinates of the image?

$$(x+6, y+2)$$



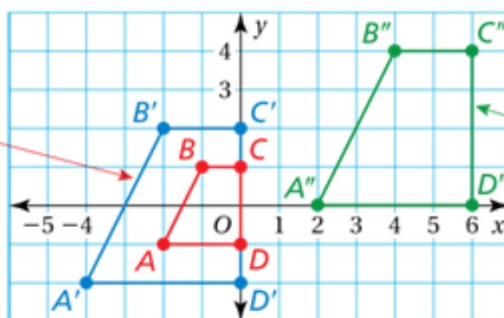
$A(-2, -1)$	$A'(-4, -2)$	$A''(2, 0)$
$B(-1, 1)$	$B'(-2, 2)$	$B''(4, 4)$
$C(0, 1)$	$C'(0, 2)$	$C''(6, 4)$
$D(0, -1)$	$D'(0, -2)$	$D''(6, 0)$



Using More Than One Transformation

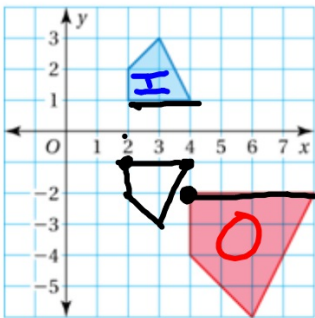
The vertices of a trapezoid are $A(-2, -1)$, $B(-1, 1)$, $C(0, 1)$, and $D(0, -1)$. Dilate the trapezoid with respect to the origin using a scale factor of 2. Then translate it 6 units right and 2 units up. What are the coordinates of the image?

Draw $ABCD$. Then dilate it with respect to the origin using a scale factor of 2.



Translate the dilated figure 6 units right and 2 units up.

Describe a Sequence of Transformations



The red figure is similar to the blue figure. Describe a sequence of transformations in which the blue figure is the image of the red figure.

Dilate $k = 0.5$ or $\frac{1}{2}$

$A(4, -2) \rightarrow A'(2, -1)$

Reflect in the x -axis

Homework

pg 87, 88

#1-3,

5-19 odd,

20-30 even

*

You will need graph paper

