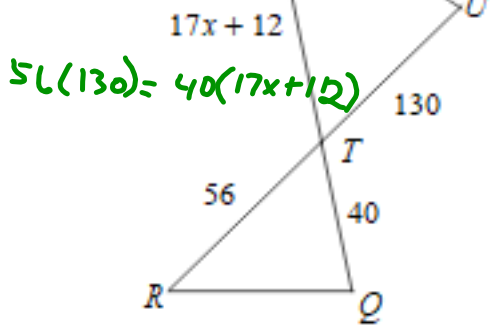


1) $\triangle TUV \sim \triangle TOR$

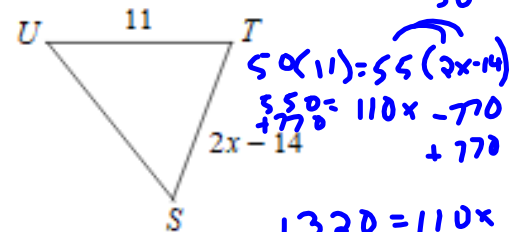
$$\frac{17x+12}{56} = \frac{130}{40}$$



$$56(130) = 40(17x+12)$$

10

2) $\triangle NML \sim \triangle UTS$ $\frac{11}{55} = \frac{2x-14}{50}$



$$56(11) = 55(2x-14)$$

$$616 = 110x - 770 + 770$$

$$\frac{1320}{110} = \frac{110x}{110}$$

$$x = 12$$



12

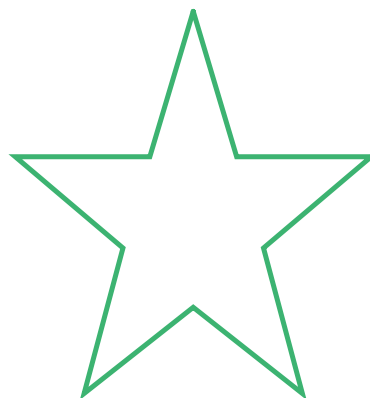
Learning Goal: Today I will learn about dilations.

Success Criteria: I am able to graph a dilation, find a scale factor and center of dilation.

9.5 Dilations

What is a dilation?

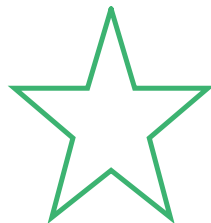
A transformation whose pre-image and image are *similar*. Every dilation has a **scale factor** and a **center**.



*What is a dilation?

ys

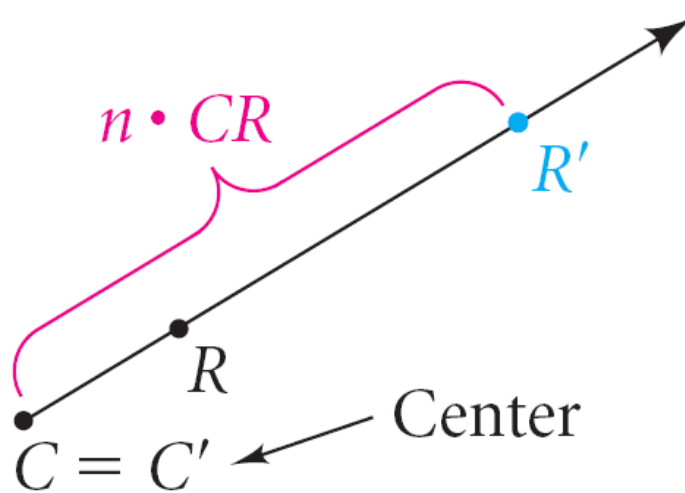
When an object changes
in **size** but not in **shape**



Finding a scale factor (n)

$$n = \frac{CR'}{CR}$$

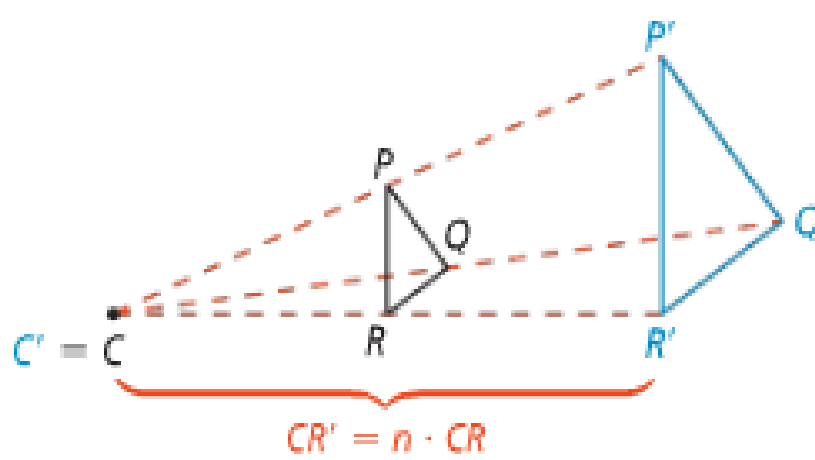
$$CR' = n \cdot CR$$



*Center of Dilation

ys

The point from which a dilation **emanates**.



A **dilation** with **center C** and **scale factor n** , $n > 0$, is a transformation with these two properties:

- The image of C is itself (that is, $C' = C$).
- For any other point R , R' is on \overrightarrow{CR} and $CR' = n \cdot CR$, or $n = \frac{CR'}{CR}$.

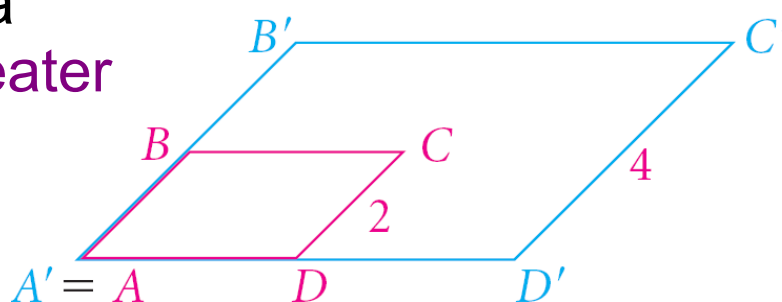
C'

The image of a dilation is similar to its preimage.

*Enlargement

ys

A dilation with a scale factor greater than one.

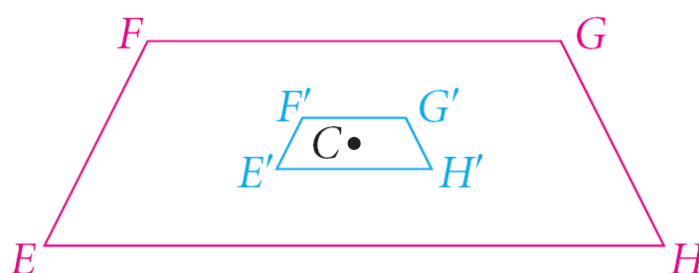


Enlargement
Center A , scale factor 2

*Reduction

ys

A dilation with a scale factor **less** than **one**.



Reduction
Center C, scale factor $\frac{1}{4}$

Problem 2 Finding a Dilation Image

What are the images of the vertices of $\triangle PZG$ for a dilation with center $(0, 0)$ and scale factor 2? Graph the image of $\triangle PZG$.

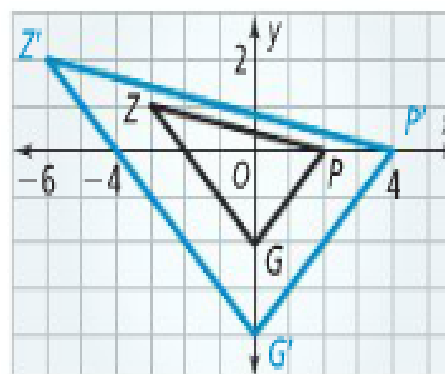
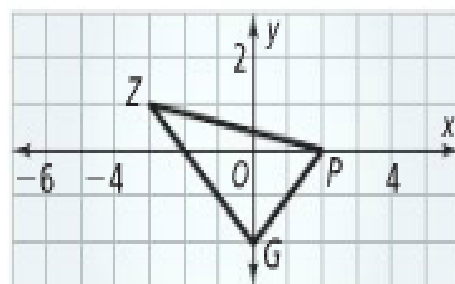
Identify the coordinates of each vertex. The center of dilation is the origin and the scale factor is 2, so use the dilation rule $(x, y) \rightarrow (2x, 2y)$.

$$P(2, 0) \rightarrow (2 \cdot 2, 2 \cdot 0), \text{ or } P'(4, 0).$$

$$Z(-3, 1) \rightarrow (2 \cdot (-3), 2 \cdot 1), \text{ or } Z'(-6, 2).$$

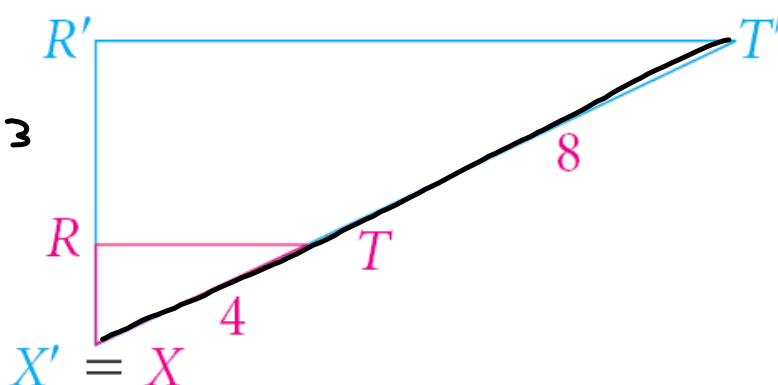
$$G(0, -2) \rightarrow (2 \cdot 0, 2 \cdot (-2)), \text{ or } G'(0, -4).$$

To graph the image of $\triangle PZG$, graph P' , Z' , and G' . Then draw $\triangle P'Z'G'$.

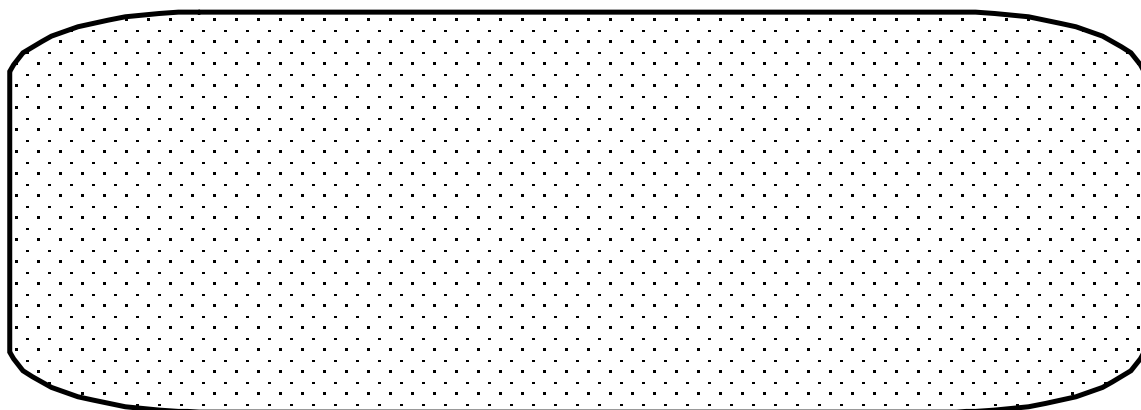


Finding a Scale Factor

$$\frac{4+8}{4} = \frac{12}{4} = 3$$

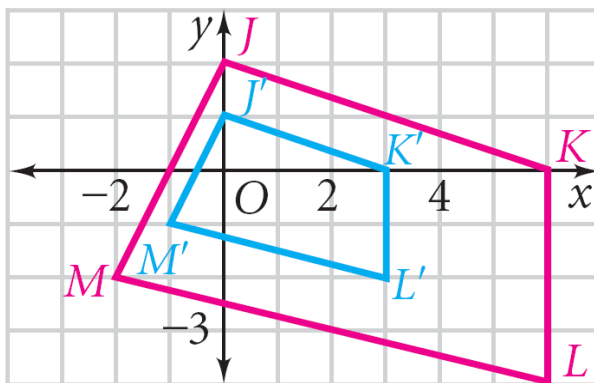


The center of dilation is X
Scale Factor: 3



Follow on worksheet

Finding a Scale Factor



Find the ordered pairs for each one

$$J(0, 2) \quad J'(0, 1)$$

$$K(6, 0) \quad K'(3, 0)$$

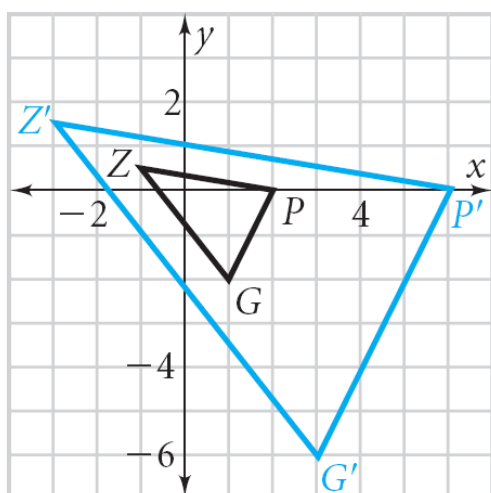
$$M(-2, -2) \quad M'(-1, -1)$$

$$L(6, -4) \quad L'(3, -2)$$

$$\frac{3}{6} = \frac{1}{2}$$

Center: (0, 0) Scale Factor: Reduction $\frac{1}{2}$

Finding a Scale Factor



Find the ordered pairs for each one

$$Z(1, 1.5) \quad Z'(-3, 1.5)$$

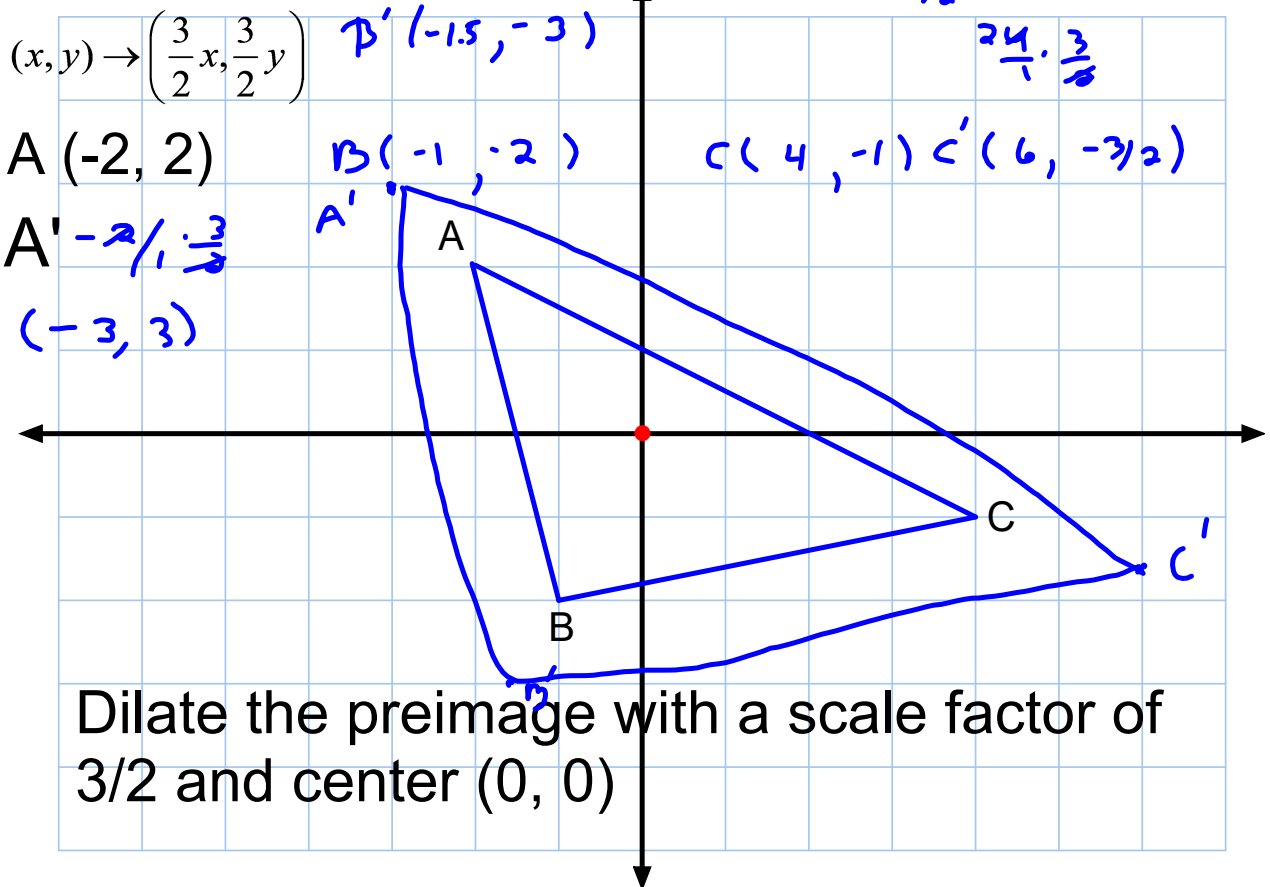
$$P(2, 0) \quad P'(6, 0)$$

$$G(1, -2) \quad G'(3, -6)$$

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

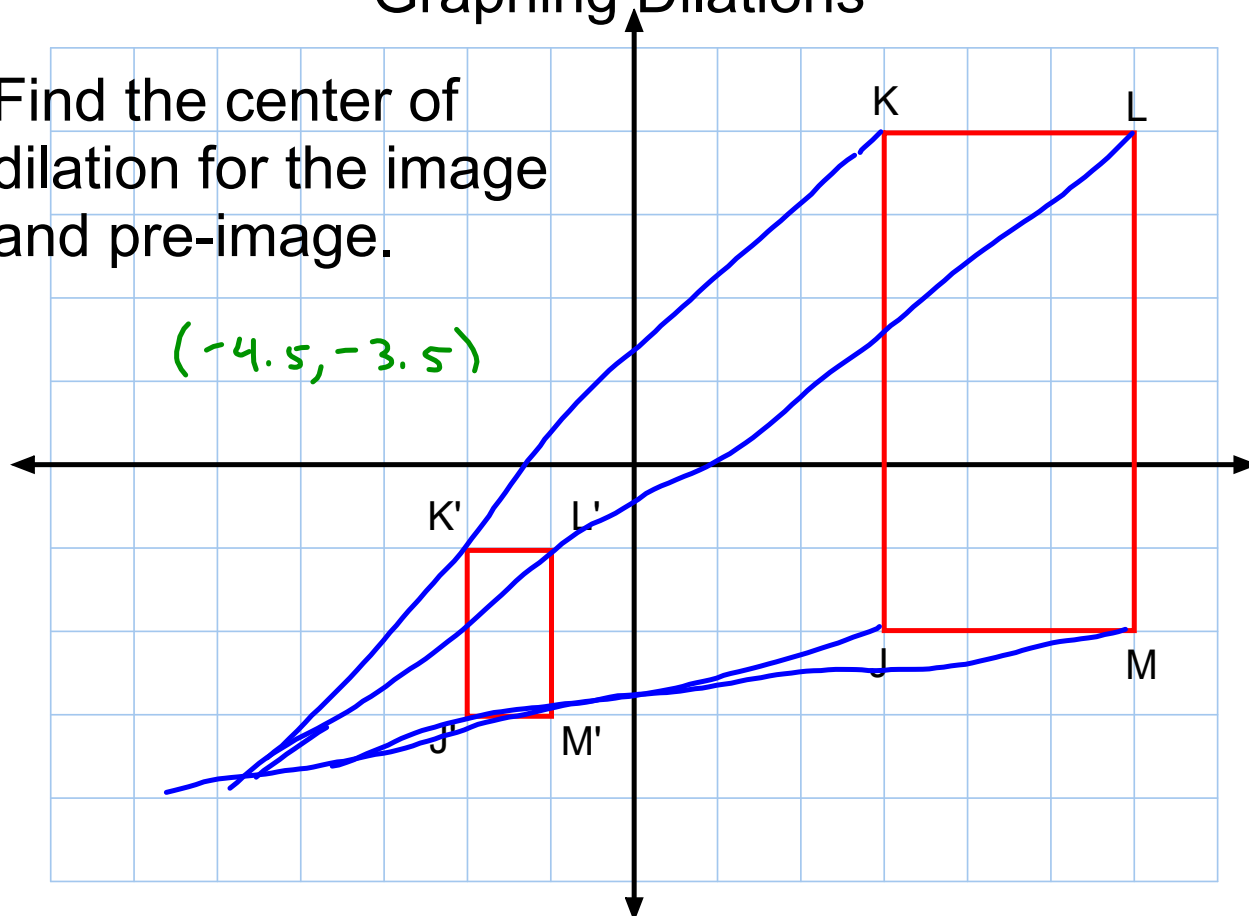
Center: (0, 0) Scale Factor: 3 Enlargement

Graphing Dilations $3/2 = 1.5$



Graphing Dilations

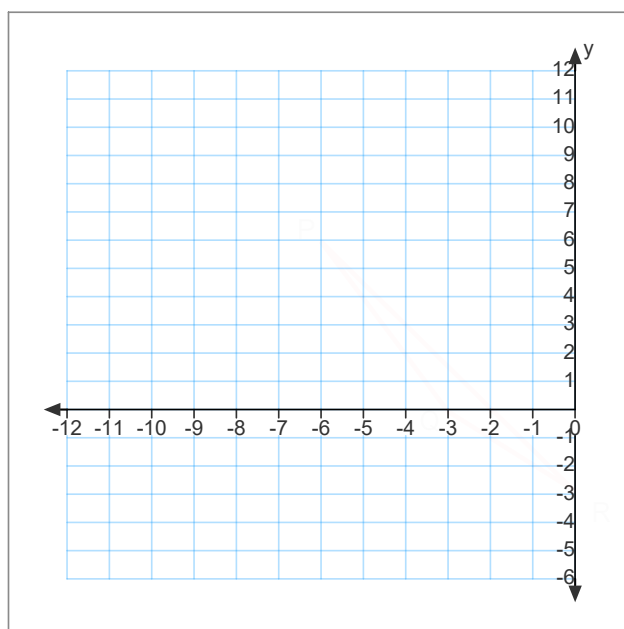
Find the center of dilation for the image and pre-image.



Find the image of $\triangle PQR$ for a dilation with center $(0, 0)$ and the given scale factor.

$$P(-6, 6), Q(-3, 0), R(0, -3)$$

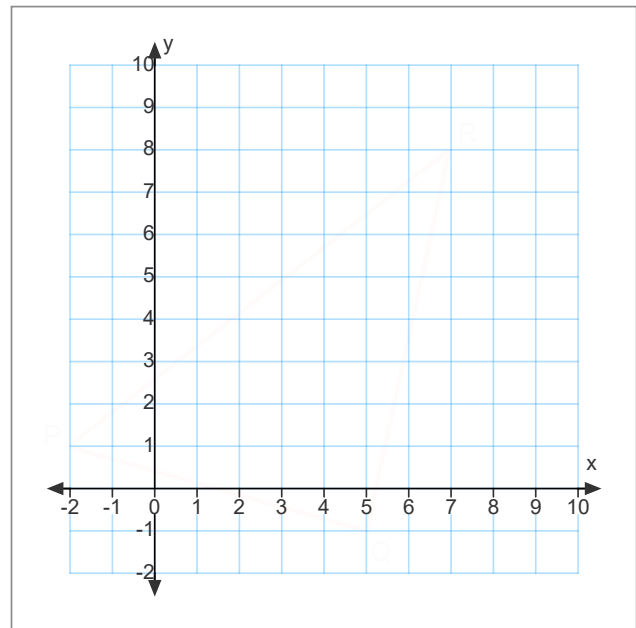
scale factor 2



Find the image of $\triangle PQR$ for a dilation with center $(0, 0)$ and the given scale factor.

$P(-2, 1)$, $Q(5, -1)$, $R(7, 8)$

scale factor $\frac{1}{4}$



Closure: Today I learned how to graph a dilation, find a scale factor and center of dilation.

Use a ruler when finding the center of dilation!

Quiz and Worksheet

