

## Warm Ups - PSAT

1

Tyra subscribes to an online gaming service that charges a monthly fee of \$5.00 and \$0.25 per hour for time spent playing premium games. Which of the following functions gives Tyra's cost, in dollars, for a month in which she spends  $x$  hours playing premium games?

- A)  $C(x) = 5.25x$   
 B)  $C(x) = 5x + 0.25$   
 C)  $C(x) = 5 + 0.25x$   
 D)  $C(x) = 5 + 25x$

9

A truck enters a stretch of road that drops 4 meters in elevation for every 100 meters along the length of the road. The road is at 1,300 meters elevation where the truck entered, and the truck is traveling at  $x$  meters per second along the road. What is the elevation of the road, in meters, at the point where the truck passes  $t$  seconds after entering the road?

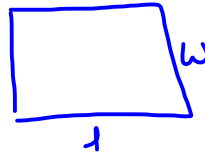
- A)  $1,300 - 0.04t$   
 B)  $1,300 - 0.64t$   
 C)  $1,300 - 4t$   
 D)  $1,300 - 16t$

$$\frac{4}{100}$$

4

A rectangle has perimeter  $P$ , length  $\ell$  and width  $w$ . Which of the following represents  $\ell$  in terms of  $P$  and  $w$ ?

- A)  $\ell = P - w$   
 B)  $\ell = \frac{2P - w}{2}$   
 C)  $\ell = \frac{P - 2w}{2}$   
 D)  $\ell = 2P - 2w$



$$P = 2l + 2w$$

$$-2w \quad -2w$$

$$\frac{P - 2w}{2} = \frac{2l}{2}$$

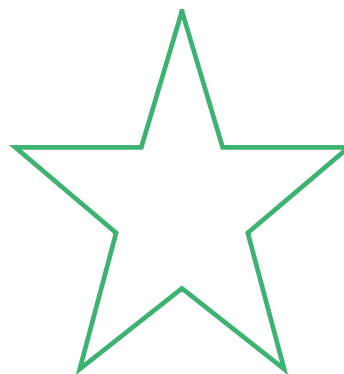
**Learning Goal:** Today I will learn about dilations.

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

## 9.5 Dilations

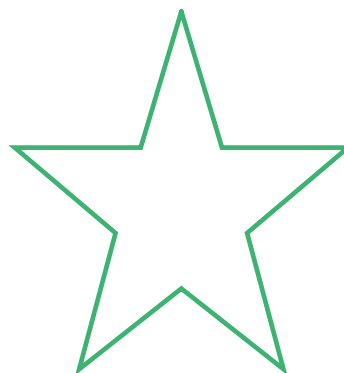
## What is a dilation?

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



## \*What is a dilation?

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



## Finding a scale factor (n)

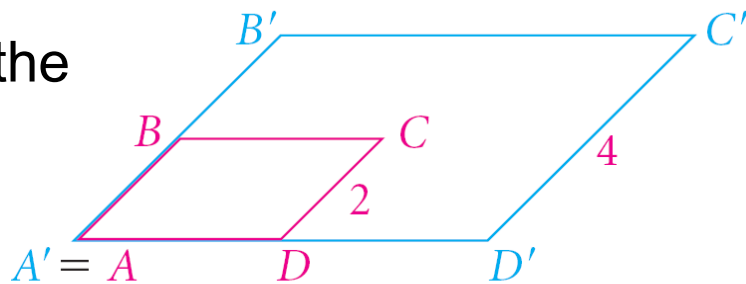
$$n = \frac{CR'}{CR} \quad \begin{array}{l} \text{image length} \\ \text{pre-image length} \end{array}$$

$$CR' = n \cdot CR$$

image = n \* pre-image

\*Enlargement

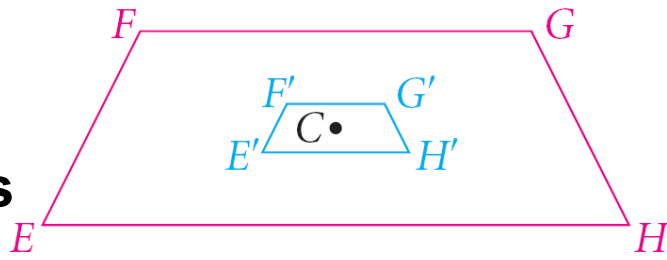
Dilation is an enlargement if the scale factor is **larger than 1**.



Enlargement  
Center A, scale factor 2

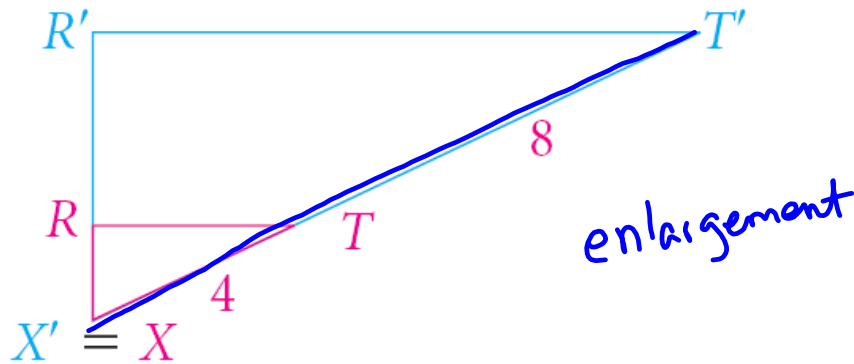
**\*Reduction**

Dilation is an reduction if the scale factor is **less** than **1**.



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

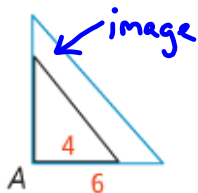
**Finding a Scale Factor**



Center:  X       Scale Factor:   $n = \frac{12}{4} = 3$

The blue figure is a dilation image of the black figure. The labeled point is the center of dilation. Tell whether the dilation is an enlargement or a reduction. Then find the scale factor of the dilation.

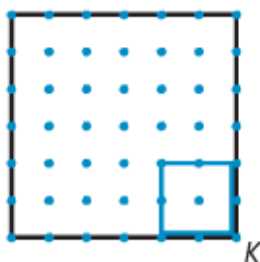
7.



enlargement

$$n = \frac{6}{4} = \frac{3}{2} \text{ or } 1.5$$

10.



reduction

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

## Graphing Dilations

$$(x, y) \rightarrow \left( \frac{3}{2}x, \frac{3}{2}y \right)$$

$$A(-2, 2) \rightarrow \left( \frac{3}{2}(-2), \frac{3}{2}(2) \right) \rightarrow (-3, 3) A'$$

$$B(-1, -2) \rightarrow \left( \frac{3}{2}(-1), \frac{3}{2}(-2) \right) \Rightarrow \left( -\frac{3}{2}, -3 \right) B'$$

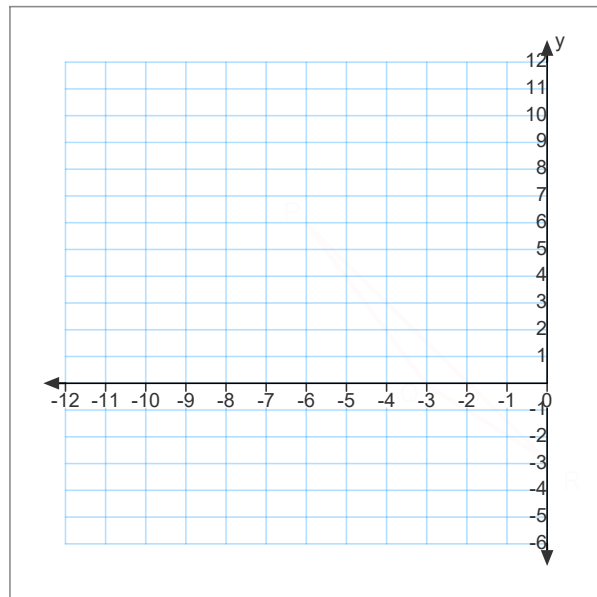
$$C(4, -1) \rightarrow \left( \frac{3}{2}(4), \frac{3}{2}(-1) \right) \rightarrow (6, -\frac{3}{2}) C'$$

Dilate the preimage with a scale factor of  $\frac{3}{2}$  and center  $(0, 0)$

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.

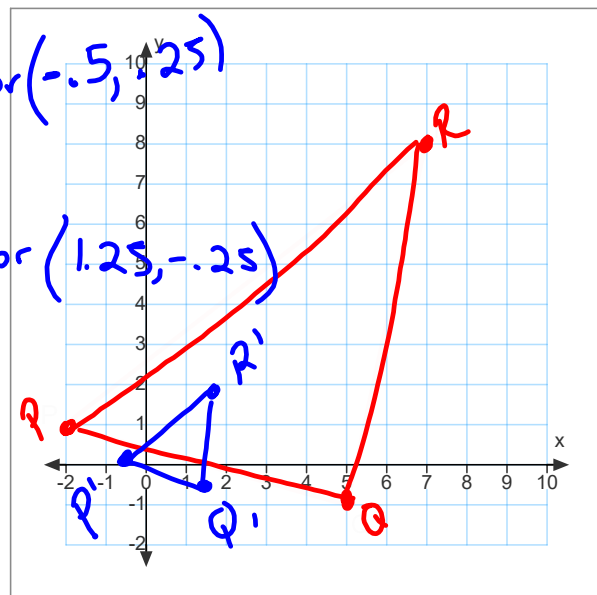
$$P(-2, 1), Q(5, -1), R(7, 8)$$

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

$$P' \left( \frac{1}{4}(-2), \frac{1}{4}(1) \right) \rightarrow \left( -\frac{1}{2}, \frac{1}{4} \right) \text{ or } (-.5, .25)$$

$$Q' \left( \frac{1}{4}(5), \frac{1}{4}(-1) \right) \rightarrow \left( \frac{5}{4}, -\frac{1}{4} \right) \text{ or } (1.25, -.25)$$

$$R' \left( \frac{1}{4}(7), \frac{1}{4}(8) \right) \rightarrow \left( \frac{7}{4}, 2 \right) \text{ or } (1.75, 2)$$

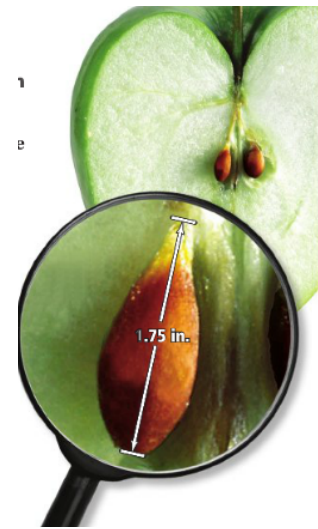


**Biology** A magnifying glass shows you an image of an object that is 7 times the object's actual size. So the scale factor of the enlargement is 7. The photo shows an apple seed under this magnifying glass. What is the actual length of the apple seed?

image length = scale factor  $\cdot$  actual length

$$\frac{1.75}{7} = \frac{7x}{7}$$

$$0.25 \text{ in} = x$$



**Magnification** You look at each object described in Exercises 19–22 under a magnifying glass. Find the actual dimension of each object. ◀

19. The image of a button is 5 times the button's actual size and has a diameter of 6 cm.
20. The image of a pinhead is 8 times the pinhead's actual size and has a width of 1.36 cm.



**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!

**Today's Work:**

Copy notes from classmate if absent.

OR

Start PSAT#3

OR

Start HW#5

