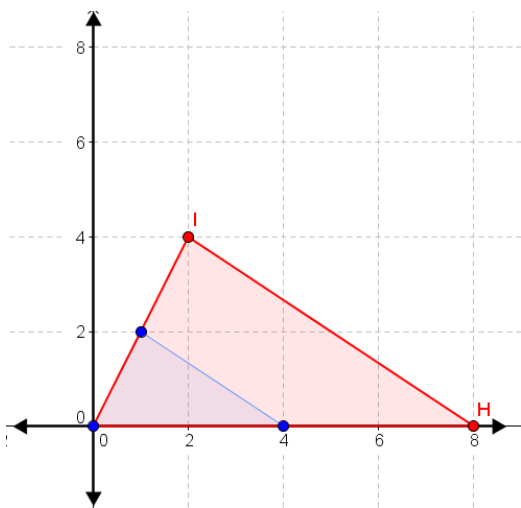


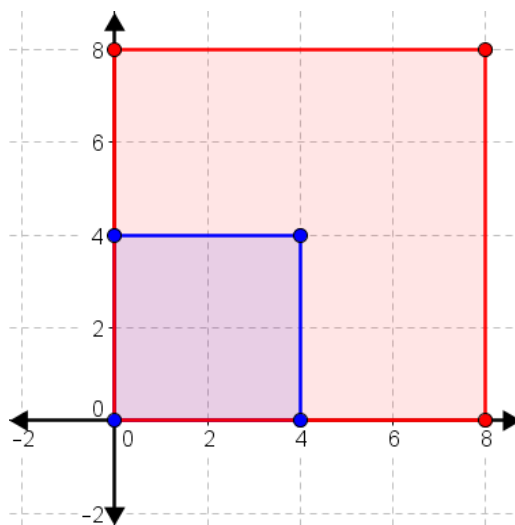
SM2 8.1: Dilations

Problems: For problems 1-6, draw the dilation image of each figure with given center and scale factor

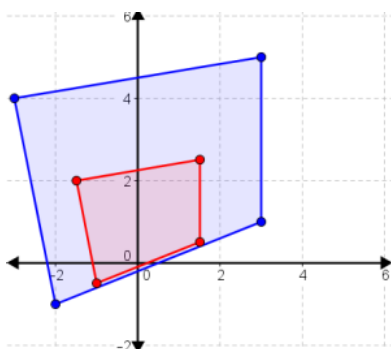
1) Center $(0, 0)$; scale factor 2



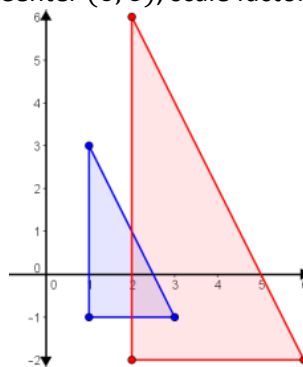
2) Center $(0, 0)$; scale factor 2



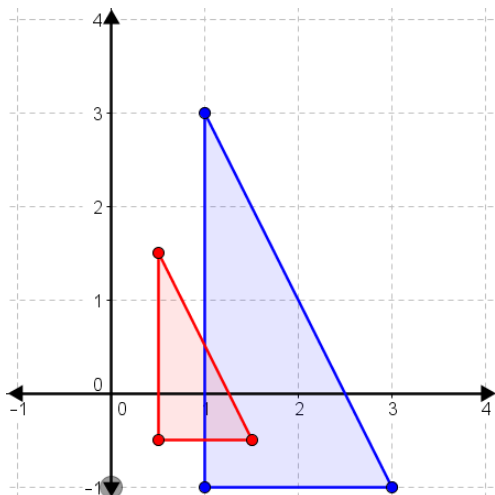
3) Center $(0, 0)$; scale factor $\frac{1}{2}$



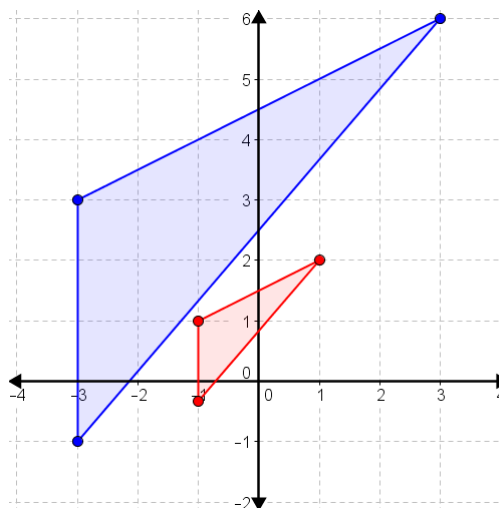
4) Center $(0, 0)$; scale factor 2



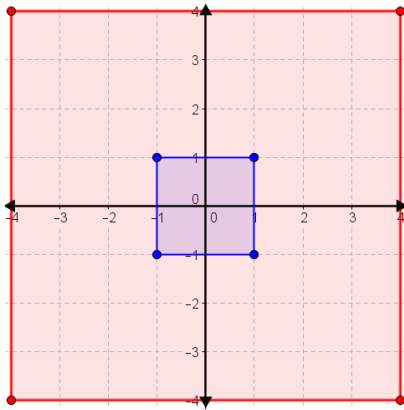
5) Center $(0, 0)$; scale factor $\frac{1}{2}$



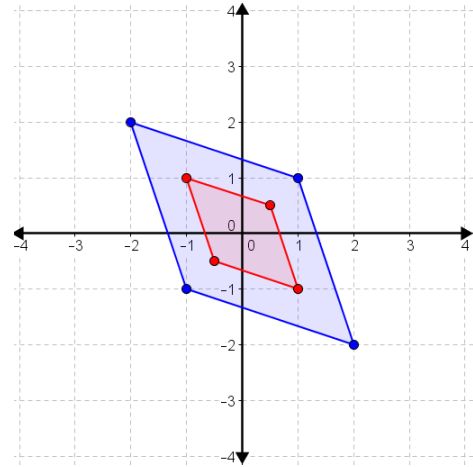
6) Center $(0, 0)$; scale factor $\frac{1}{3}$



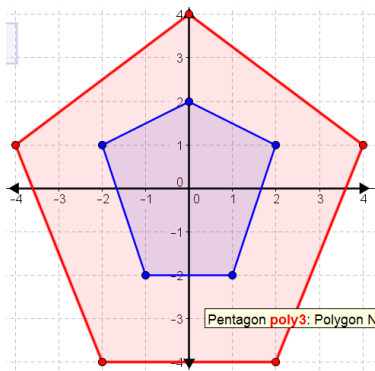
7) Center $(0, 0)$; scale factor 4



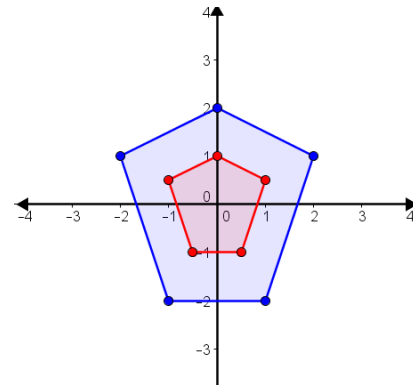
8) Center $(0, 0)$; scale factor $\frac{1}{2}$



9) Center $(0, 0)$; scale factor 2



10) Center $(0, 0)$; scale factor $\frac{1}{2}$



Determine whether each statement is true or false.

11) A dilation with a scale factor greater than 1 will shrink the image.

False

12) For a dilation, corresponding angles of the image and pre-image are congruent.

True

13) A dilation image cannot have any points in common with its pre-image.

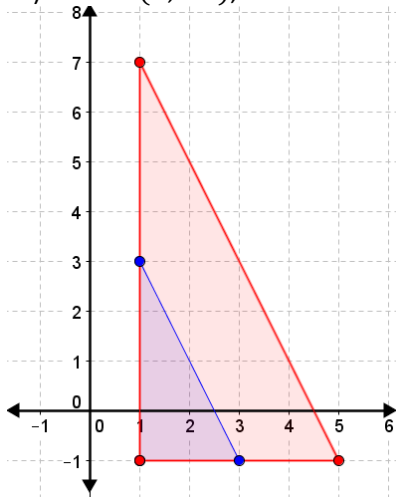
False

14) A dilation preserves length.

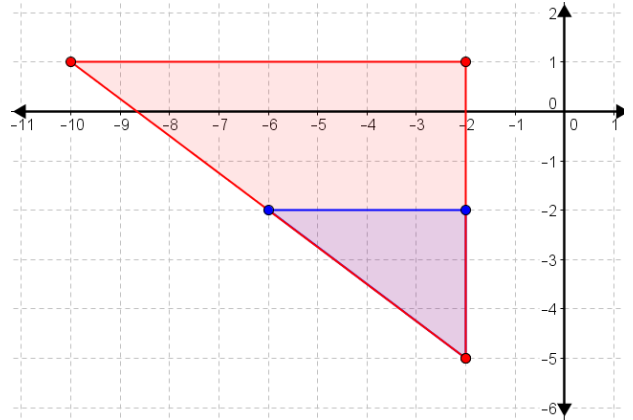
False

Draw the dilation image of each figure with the given center of dilation at and the scale factor.

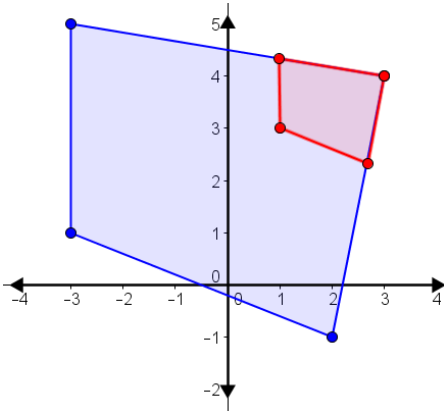
15) Center $(1, -1)$; scale factor 2



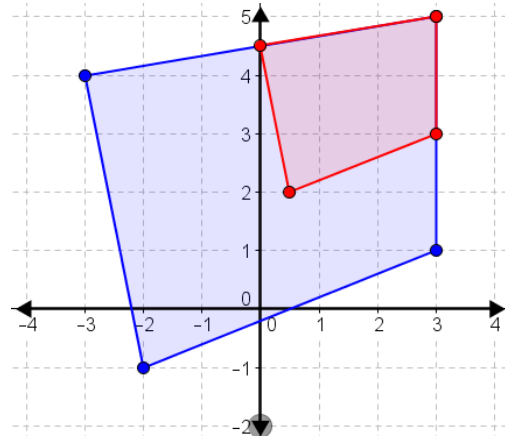
16) Center $(-2, -5)$; scale factor 2



17) Center $(3, 4)$; scale factor $\frac{1}{3}$

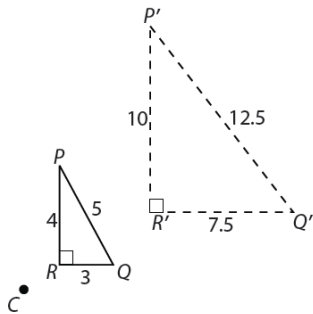


18) Center $(3, 5)$; scale factor $\frac{1}{2}$



The following transformations represent dilations. Determine the scale factor and whether the dilation is an enlargement, a reduction, or a congruency transformation.

19)

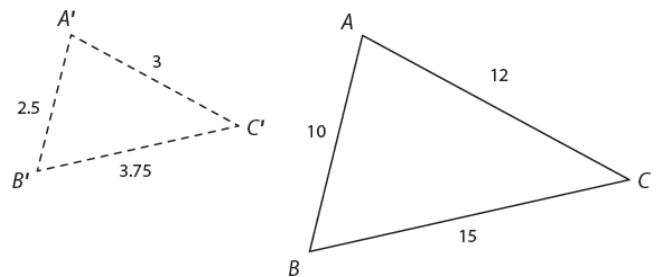


Since the transformations are dilations the ratio of the side lengths should give me the scale factor:

$$\frac{10}{4} = 2.5, \quad \frac{12.5}{5} = 2.5, \quad \frac{7.5}{3} = 2.5$$

Scale Factor: 2.5; enlargement

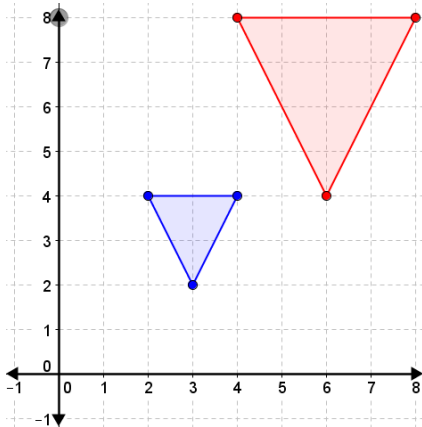
20)



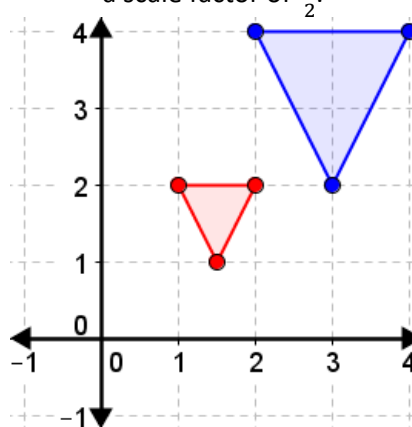
$$\frac{2.5}{10} = \frac{1}{4}, \quad \frac{3}{12} = \frac{1}{4}, \quad \frac{3.75}{15} = \frac{1}{4}$$

Scale Factor: $\frac{1}{4}$; reduction

- 21) Graph the pre-image with given vertices. $J(2, 4)$, $K(4, 4)$, and $P(3, 2)$. Then graph the image with center of dilation at the origin and a scale factor of 2.

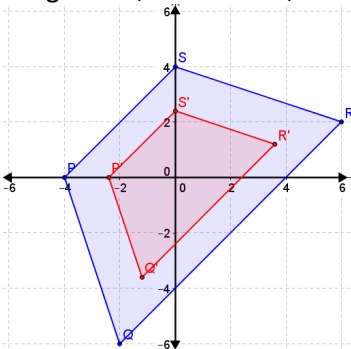


- 22) Graph the pre-image with given vertices. $J(2, 4)$, $K(4, 4)$, and $P(3, 2)$. Then graph the image with center of dilation at the origin and a scale factor of $\frac{1}{2}$.



Application Problems:

- 23) A university wants to put in a courtyard for a new building. The courtyard is bounded by the coordinates $P(-4, 0)$, $Q(-2, -6)$, $R(6, 2)$, and $S(0, 4)$. The landscape architects created a dilation of the space through the center $C(0, 0)$ to outline the garden. The garden is bounded by the points $P'(-2.4, 0)$, $Q'(-1.2, -3.6)$, $R'(3.6, 1.2)$, and $S'(0, 2.4)$. What is the scale factor? Does this represent an enlargement, a reduction, or a congruency transformation? Explain.



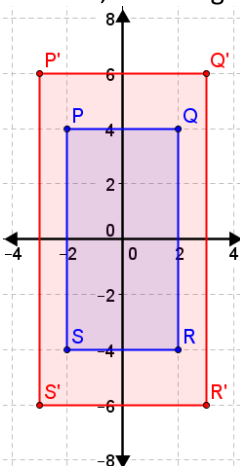
Find the ratio between the corresponding points:

$$\frac{-2.4}{-4} = .6$$

So the Scale Factor is $.6$ or $\frac{3}{5}$

It represents a reduction.

- 24) A neighborhood committee is planning a new community pool. The committee has proposed a design for the pool. The design consists of two rectangles. The inner rectangle is the pool, and has been dilated about $C(0, 0)$ to create the concrete walkway that will border the pool. The vertices of the pool are $P(-2, 4)$, $Q(2, 4)$, $R(2, -4)$, and $S(-2, -4)$. The vertices of the outside edge of the concrete walkway are $P'(-3, 6)$, $Q'(3, 6)$, $R'(3, -6)$, and $S'(-3, -6)$. What is the scale factor? Does this represent an enlargement, a reduction, or a congruency transformation? Explain.



Find the ratio between the corresponding points:

$$\frac{-3}{-2} = 1.5$$

So the Scale Factor is 1.5 or $\frac{3}{2}$

It represents an enlargement.