

3/2/20 - Warm Up Problem

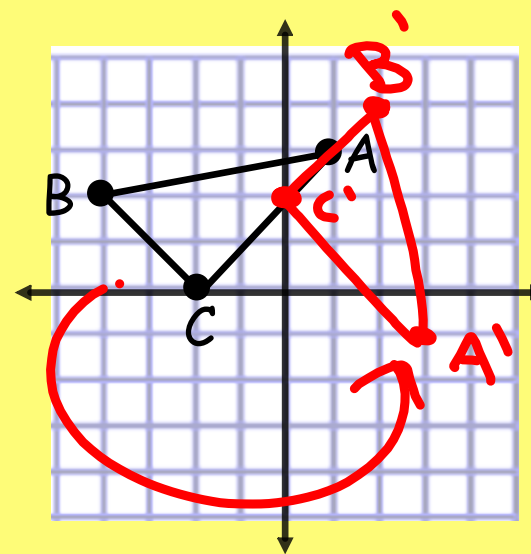
Find the coordinates of each point after being rotated 270 degrees. Graph the rotated triangle.

$$r_{(270^\circ, 0)}(x, y) = (y, -x)$$

$$A(1, 3) = (3, -1)$$

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

$$C(-2, 0) = (0, 2)$$



Concept 22 - Dilations

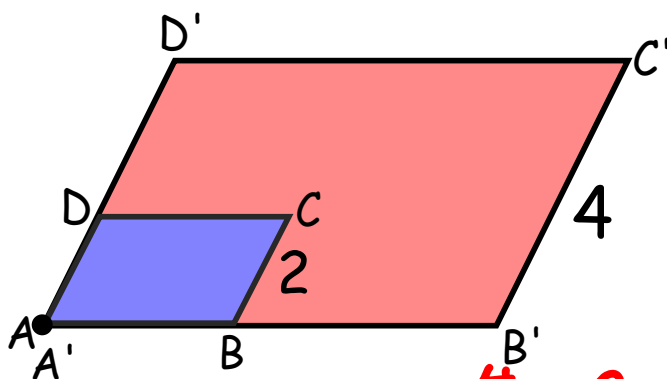
Goals: find scale factors of dilations and draw dilations

Dilation: a transformation that increases or decreases the size of a figure - **NOT A RIGID MOTION**

SCALE FACTOR = $\frac{\text{dilated measure}}{\text{original measure}}$

ENLARGEMENT:

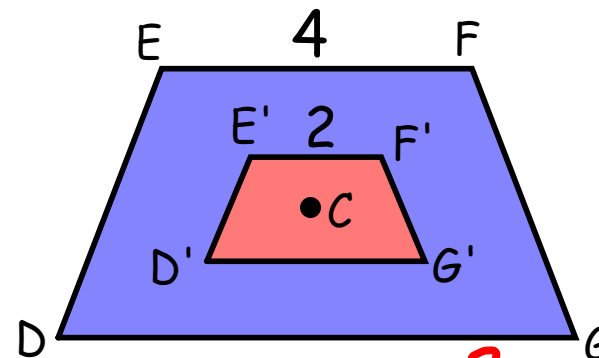
- increases in size
- scale factor is greater than 1



$$\text{Scale factor} = \frac{4}{2} = 2$$

REDUCTION:

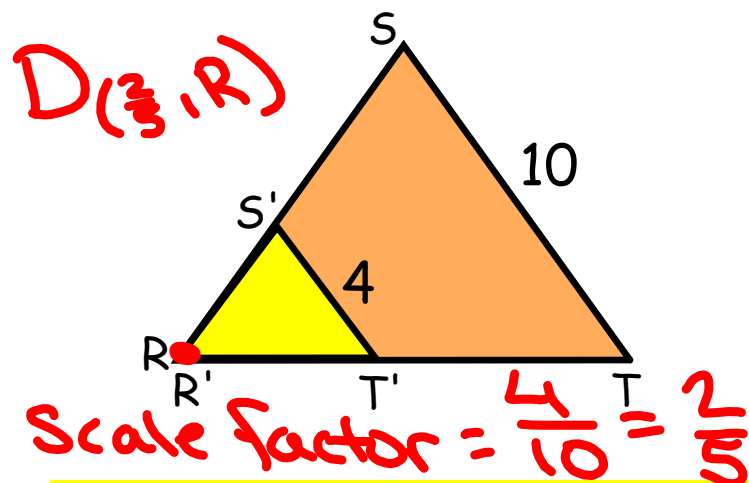
- decreases in size
- scale factor is between 0 and 1



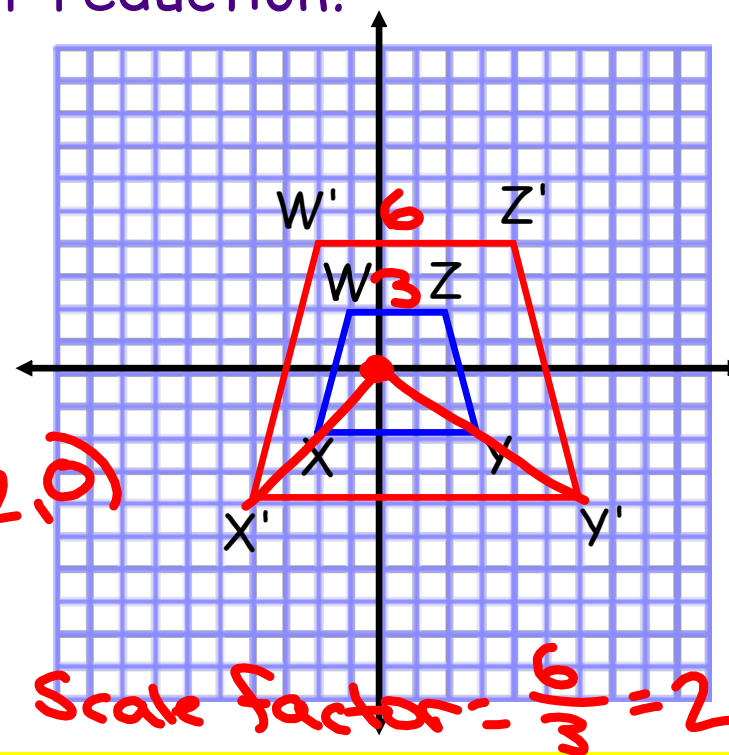
$$\text{Scale factor} = \frac{2}{4} = \frac{1}{2}$$

Is the dilation an enlargement or reduction?
What is the scale factor?

$$\text{Scale Factor} = \frac{\text{dilated measure}}{\text{original measure}}$$



$D(2, O)$



Function Notation for Dilations

$$D_{(n,C)}(A) = A'$$

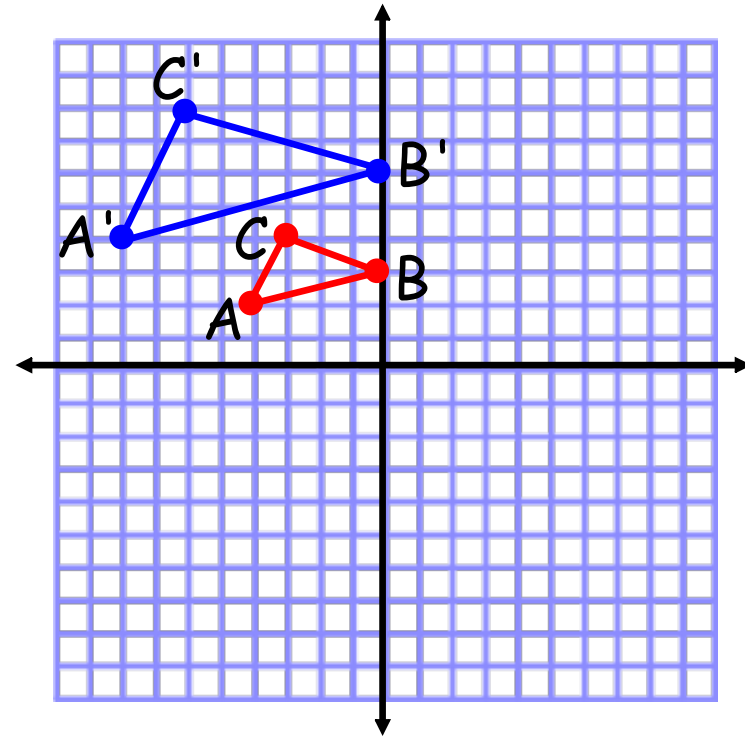
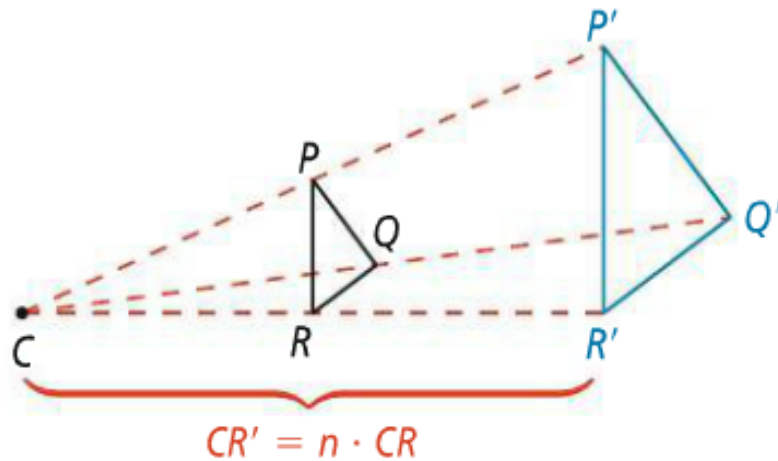
Scale factor \rightarrow n
center \rightarrow C

means Point A has been dilated by scale factor n and center at C

DILATIONS IN THE COORDINATE PLANE

- the origin is the center of the dilation in the coordinate plane

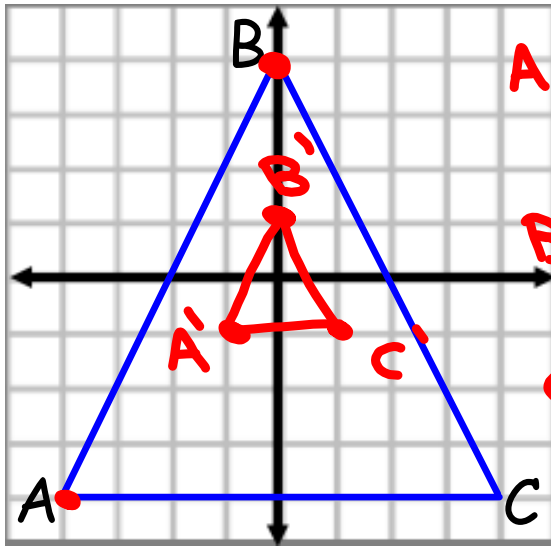
$$D_{(n,0)}(x,y) \rightarrow (nx, ny) \quad \text{multiply by scale factor}$$



Dilations in the Coordinate Plane

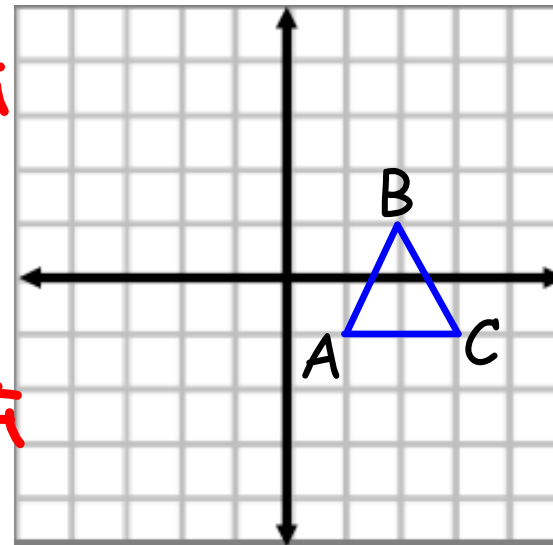
*multiply each point by the scale factor to graph a dilation

$$D_{\left(\frac{1}{4}, 0\right)}(\triangle ABC)$$



$$\begin{aligned} A(-4, -4) \times \frac{1}{4} \\ (-1, -1) \\ B(0, 4) \times \frac{1}{4} \\ (0, 1) \\ C(4, -4) \times \frac{1}{4} \\ (1, -1) \end{aligned}$$

$$D_{(2, 0)}(\triangle ABC)$$



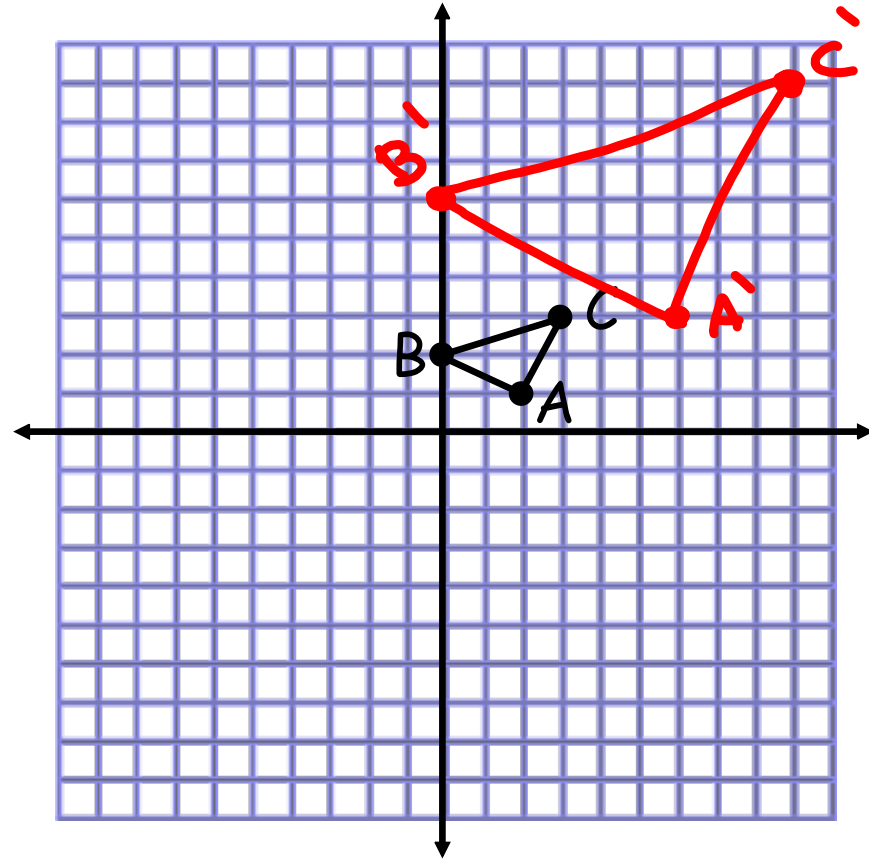
Do this one in your notes...

$$D_{(3,0)}(\triangle ABC)$$

$$A(2,1) \times 3 = (6,3)$$

$$B(0,2) \times 3 = (0,6)$$

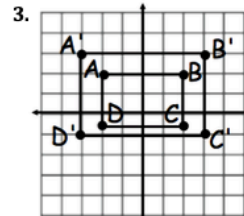
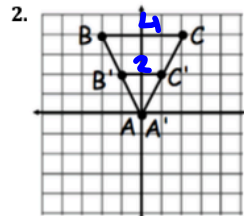
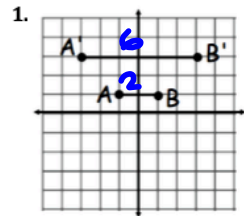
$$C(3,3) \times 3 = (9,9)$$



Assignment: Concept 22 Worksheet (1-a)

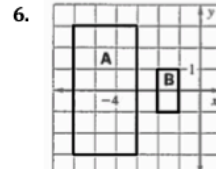
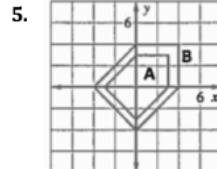
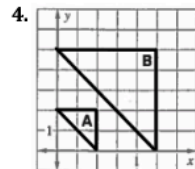
DILATIONS AND SCALE FACTOR

Determine whether the dilation is an enlargement or a reduction. Then, find its scale factor.



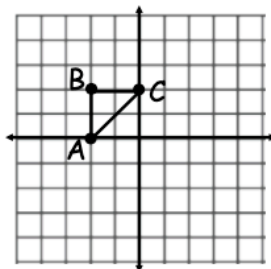
enlargement
Scale factor = $\frac{6}{2} = 3$

Determine whether the dilation from Figure A to Figure B is a reduction or an enlargement. Then, find its scale factor.



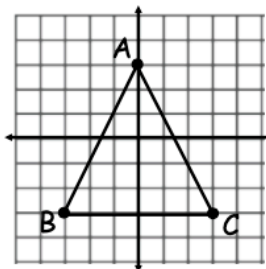
Draw the dilation of each figure according to the given rule.

7. $D_2(\triangle ABC)$



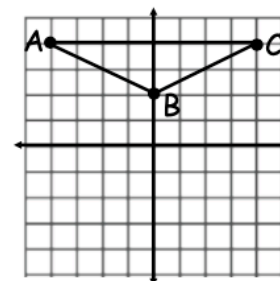
- A (-2,0) $\times 2 =$
- B (-2,2) $\times 2 =$
- C (0,2) $\times 2 =$

8. $D_{\frac{2}{3}}(\triangle ABC)$



- A (0,3)
- B (-3, -3)
- C (3, -3)

9. $D_{\frac{1}{2}}(\triangle ABC)$



- A (-4, 4)
- B (0, 2)
- C (4, 4)