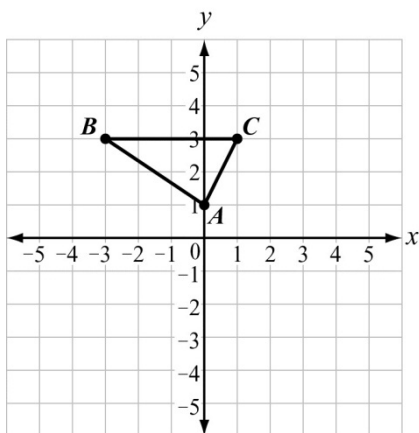


REVIEW EXAMPLES

1. Draw a triangle with vertices at $A(0, 1)$, $B(-3, 3)$, and $C(1, 3)$. Dilate the triangle using a scale factor of 1.5 and a center of $(0, 0)$. Sketch and name the dilated triangle $A'B'C'$.

Solution:

Plot points $A(0, 1)$, $B(-3, 3)$, and $C(1, 3)$. Draw \overline{AB} , \overline{AC} , and \overline{BC} .



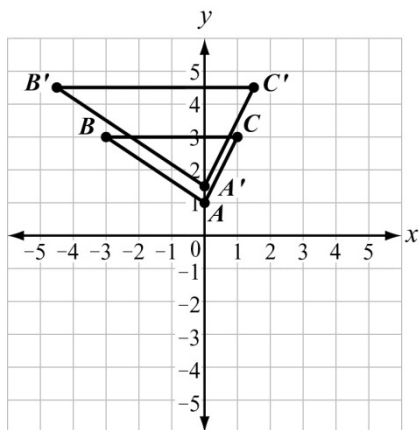
The center of dilation is the origin, so to find the coordinates of the image, multiply the coordinates of the pre-image by the scale factor 1.5.

$$\text{Point } A': (1.5 \cdot 0, 1.5 \cdot 1) = (0, 1.5)$$

$$\text{Point } B': (1.5 \cdot (-3), 1.5 \cdot 3) = (-4.5, 4.5)$$

$$\text{Point } C': (1.5 \cdot 1, 1.5 \cdot 3) = (1.5, 4.5)$$

Plot points $A'(0, 1.5)$, $B'(-4.5, 4.5)$, and $C'(1.5, 4.5)$. Draw $\overline{A'B'}$, $\overline{A'C'}$, and $\overline{B'C'}$.



Note: Since no part of the pre-image passes through the center of dilation, $\overline{BC} \parallel \overline{B'C'}$, $\overline{AB} \parallel \overline{A'B'}$, and $\overline{AC} \parallel \overline{A'C'}$.

2. Line segment CD is 5 inches long. If line segment CD is dilated to form line segment $C'D'$ with a scale factor of 0.6, what is the length of line segment $C'D'$?

Solution:

The ratio of the length of the image and the pre-image is equal to the scale factor.

$$\frac{C'D'}{CD} = 0.6$$

Substitute 5 for CD .

$$\frac{C'D'}{5} = 0.6$$

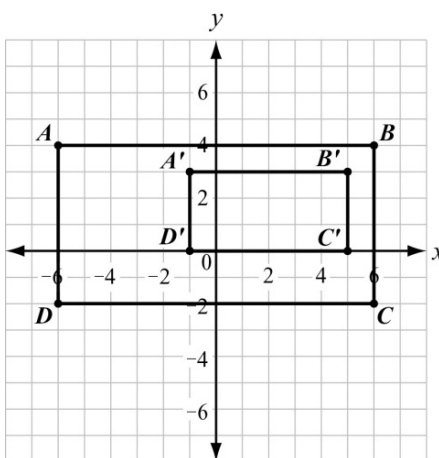
Solve for $C'D'$.

$$C'D' = 0.6 \cdot 5$$

$$C'D' = 3$$

The length of line segment $C'D'$ is 3 inches.

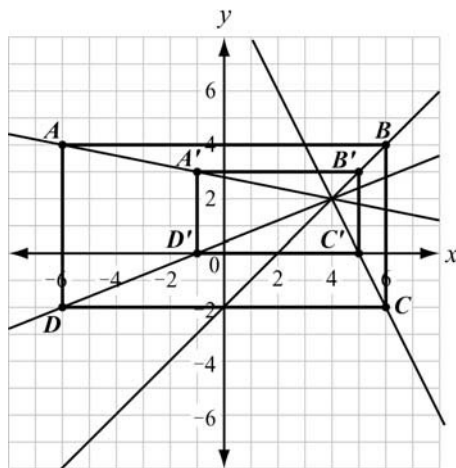
3. Figure $A'B'C'D'$ is a dilation of figure $ABCD$.



- Determine the center of dilation.
- Determine the scale factor of the dilation.
- What is the relationship between the sides of the pre-image and the corresponding sides of the image?

Solution:

- a. To find the center of dilation, draw lines connecting each corresponding vertex from the pre-image to the image. The lines meet at the center of dilation.



The center of dilation is (4, 2).

- b. Find the ratios of the lengths of the corresponding sides.

$$\frac{A'B'}{AB} = \frac{6}{12} = \frac{1}{2}$$

$$\frac{B'C'}{BC} = \frac{3}{6} = \frac{1}{2}$$

$$\frac{C'D'}{CD} = \frac{6}{12} = \frac{1}{2}$$

$$\frac{A'D'}{AD} = \frac{3}{6} = \frac{1}{2}$$

The ratio for each pair of corresponding sides is $\frac{1}{2}$, so the scale factor is $\frac{1}{2}$.

- c. Each side of the image is parallel to the corresponding side of its pre-image and is $\frac{1}{2}$ the length.

Note: Lines connecting corresponding points pass through the center of dilation.