

Lesson 7-5

Example 1

Draw the dilation of $\triangle MNO$ with vertices $M(0, 2)$, $N(-1, 1)$, and $O(1, -2)$ with the center of dilation at the origin and a scale factor of 2.

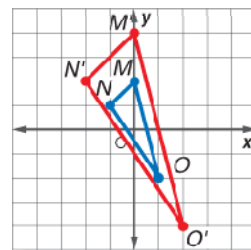
Solution

Graph $\triangle MNO$. Multiply the x -coordinates and y -coordinates of each vertex by the scale factor of 2.

$$M(0, 2) \rightarrow M'(0 \cdot 2, 2 \cdot 2) = M'(0, 4)$$

$$N(-1, 1) \rightarrow N'(-1 \cdot 2, 1 \cdot 2) = N'(-2, 2)$$

$$O(1, -2) \rightarrow O'(1 \cdot 2, -2 \cdot 2) = O'(2, -4)$$



Example 2

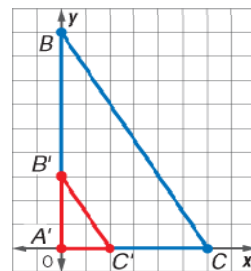
Draw the dilation image of $\triangle ABC$ with the center of dilation at A and a scale factor of $\frac{1}{3}$.

Solution

The distance from the center of dilation, A , to B is 9 units. So the distance from A to B' is $\frac{1}{3} \cdot 9 = 3$ units.

The distance from A to C is 6 units. So the distance from A to C' is $\frac{1}{3} \cdot 6 = 2$ units.

Points A and A' coincide.



Example 3

EDUCATION Teachers often use an overhead projector to display information from a transparency on a wall. This is an example of using dilations. Suppose that a transparency is originally $8\frac{1}{2}$ in. by 11 in.

- If the image from the projector is $42\frac{1}{2}$ in. by 55 in., what is the scale factor of the dilation?
- If the scale factor is 8, what are the dimensions of the projection?

Solution

- To determine the scale factor, compare the original dimensions of the transparency to the size of the projection on the wall.

$$42\frac{1}{2} \div 8\frac{1}{2} = 5 \qquad 55 \div 11 = 5$$

The length and width of the projection on the wall are 5 times those of the transparency, so the scale factor is 5.

- To find the size of the projection on the wall, multiply the length and width of the transparency by the scale factor.

$$8\frac{1}{2} \cdot 5 = 42\frac{1}{2} \qquad 11 \cdot 5 = 55$$

The projection is $42\frac{1}{2}$ in. by 55 in.