

Study Guide

Integration: Geometry Dilations

Enlarging or reducing a figure is called a **dilation**. A dilated figure is similar to the original figure. The ratio of the new figure to the original is called the scale factor.

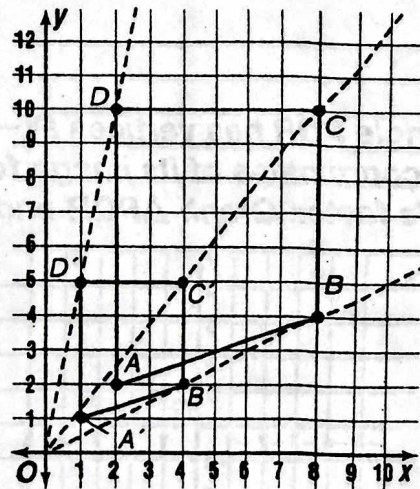
Example Graph trapezoid $ABCD$ with vertices $A(2, 2)$, $B(8, 4)$, $C(8, 10)$, $D(2, 10)$. Graph its dilation with a scale factor of 0.5.

To find the vertices of the dilation image, multiply each coordinate in the ordered pairs by 0.5.

- $A(2, 2) \rightarrow (2 \cdot 0.5, 2 \cdot 0.5) \rightarrow A'(1, 1)$
- $B(8, 4) \rightarrow (8 \cdot 0.5, 4 \cdot 0.5) \rightarrow B'(4, 2)$
- $C(8, 10) \rightarrow (8 \cdot 0.5, 10 \cdot 0.5) \rightarrow C'(4, 5)$
- $D(2, 10) \rightarrow (2 \cdot 0.5, 10 \cdot 0.5) \rightarrow D'(1, 5)$

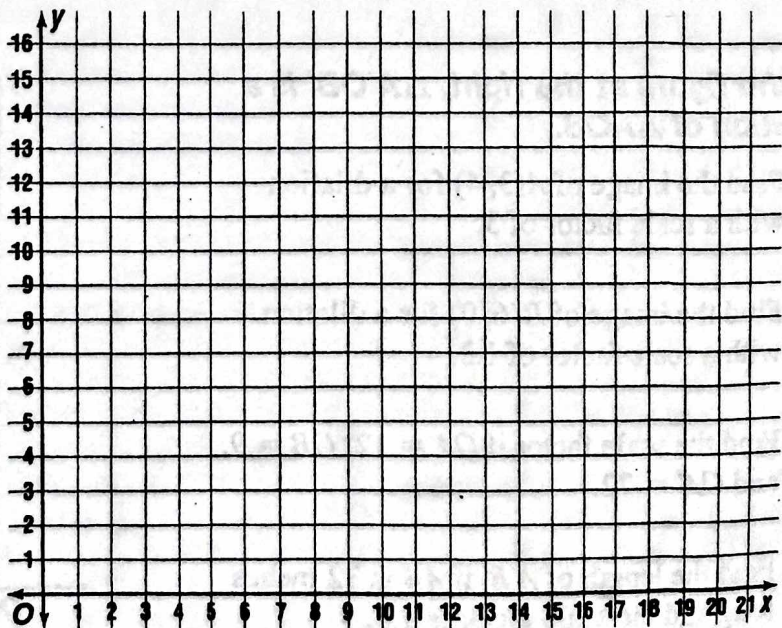
Graph trapezoid $A'B'C'D'$.

To check the graph, draw lines from the origin through each of the vertices of the original figure. The vertices of the dilated figure should lie on the same lines.



Triangle LMN has vertices $L(8, 2)$, $M(10, 8)$, $N(4, 6)$. Find the coordinates of its image for a dilation with each given scale factor. Graph $\triangle LMN$ and each dilation.

1. 0.5
2. 1.5
3. 2

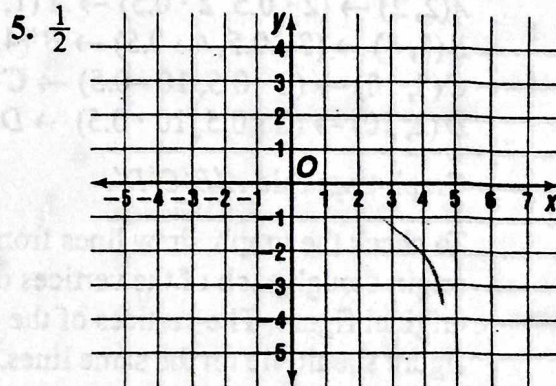
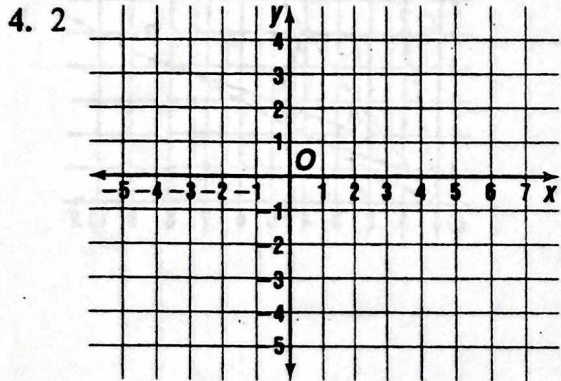


Integration: Geometry Dilations

Find the coordinates of the image of each point for a dilation with a scale factor of $\frac{3}{2}$.

1. $A(4, 8)$ 2. $B(3, 10)$ 3. $C(-2, -5)$

Triangle PQR has vertices $P(-2, 2)$, $Q(3, 2)$, and $R(0, -2)$. Find the coordinates of its image for a dilation with each given scale factor. Graph $\triangle PQR$ and each dilation.



In the figure at the right, $\triangle A'OB'$ is a dilation of $\triangle AOB$.

- Find the image of $A(3, 4)$ for a dilation with a scale factor of 3.
- Find the image of $B(6, 0)$ for a dilation with a scale factor of 1.3.
- Find the scale factor if $OA = 12$, $OB = 9$, and $OA' = 72$.
- Find the length of $A'B'$ if AB is 32 inches long and the scale factor is 1.5.

