LESSON 8.7

NAME _____ DATE _____

Challenge: Skills and Applications

For use with pages 506–513

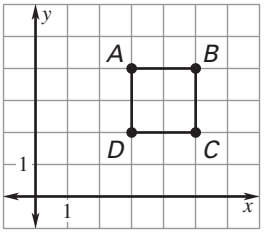
To find the coordinates of a point on the image of a dilation *not* centered at the origin, you can follow the steps below.

Step 1 Subtract the horizontal coordinate of the center from the horizontal coordinate of the point on the preimage. Then subtract the vertical coordinate of the center from the vertical coordinate of the point on the preimage.

Step 2 Multiply the differences you found in Step 1 by the scale factor.

Step 3 Add the horizontal and vertical coordinates of the center to the horizontal and vertical components you found in Step 2.

1. Refer to the diagram at the right. Use the steps above to draw a dilation of square *ABCD* using the center $(4, 3)$ and a scale factor of 2.

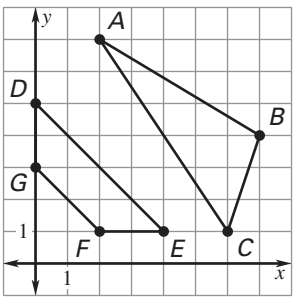


2. Let (x, y) be the coordinates of a point on the preimage, let (a, b) be the coordinates of the center of the dilation, and let k be the scale factor.

a. Use the steps listed above and the variables x, y, a, b, and k to write variable expressions for the horizontal and vertical coordinates of the point on the image that corresponds to the point (x, y) on the preimage.

b. Use the variable expressions you wrote in part (a) to find the coordinates of the vertices of a dilation of square *ABCD* shown above using the center $(4, 3)$ and a scale factor of 2. Use these coordinates to draw the dilation. Does your drawing match your drawing from Exercise 1?

In Exercises 3–8, refer to the diagram below. First find the vertices of the image after the dilation described. Then use the vertices to draw the image and preimage in the same coordinate plane.



3. Dilate $\triangle ABC$ using center $(6, 1)$ and scale factor 4.

4. Dilate $\triangle ABC$ using center $(4, 4)$ and scale factor 3.

5. Dilate $\triangle ABC$ using center $(-2, 13)$ and scale factor 2.

6. Dilate trapezoid *DEFG* using center $(0, 1)$ and scale factor 2.

7. Dilate trapezoid *DEFG* using center $(2, 3)$ and scale factor $\frac{3}{2}$.

8. Dilate trapezoid *DEFG* using center $(0, 9)$ and scale factor $\frac{1}{2}$.

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