Name _____ Date _____

RETEACHING 9.5

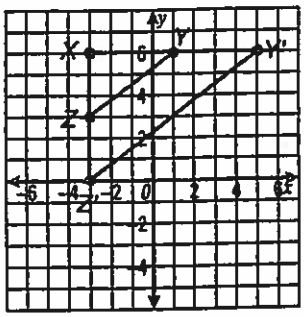
DILATIONS IN THE COORDINATE PLANE

A **dilation** is a transformation under which a figure is enlarged or reduced to form an image that is similar to the original figure. You need to know the **center of dilation** and the **scale factor** to graph the image of a figure under dilation.

For a center of dilation at the origin and a scale factor of k, use the rule $(x, y) \rightarrow (kx, ky)$ to find the coordinates of the image.

Example

Graph the dilation image of $\triangle XYZ$ using a scale factor of 2 and the center of dilation at vertex X.



Solution

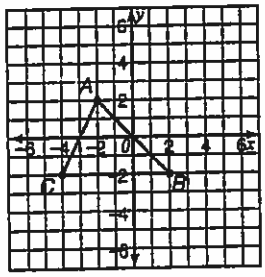
The distance from X to Y is 4 units, so the distance from X' to Y' is $4 \cdot 2$, or 8 units.
The distance from X to Z is 3 units, so the distance from X' to Z' is $3 \cdot 2$, or 6 units.
X and X' are at the same point since X is the center of the dilation.

EXERCISES

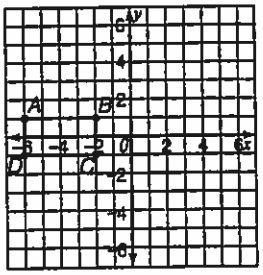
Find the coordinates of each point under the given dilation.

1. $(-3, 2)$; scale factor of 2, center of dilation at the origin _____
2. $(8, 4)$; scale factor of $\frac{1}{4}$, center of dilation at the origin _____

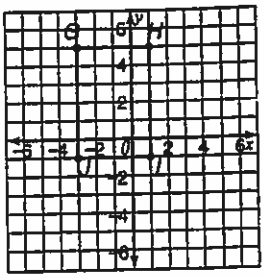
3. Graph the dilation image of triangle ABC, using a scale factor of $\frac{1}{2}$ and the center of dilation at the origin.



4. Graph the dilation image of rectangle $ABCD$, using a scale factor of 3 and the center of dilation at vertex D.



5. Graph the dilation image of figure $GHIJ$, using a scale factor of $\frac{1}{2}$ and the center of dilation at vertex J.



Name _____ Date _____

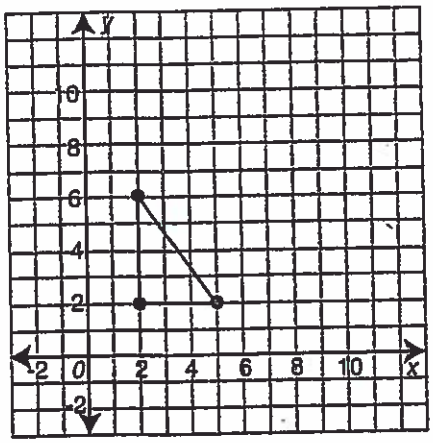
EXTRA PRACTICE

DILATIONS IN THE COORDINATE PLANE

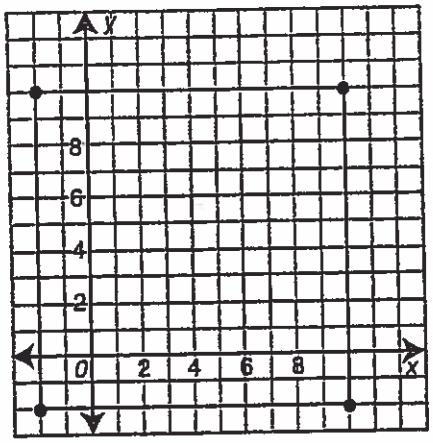
EXERCISES

Draw each dilation image.

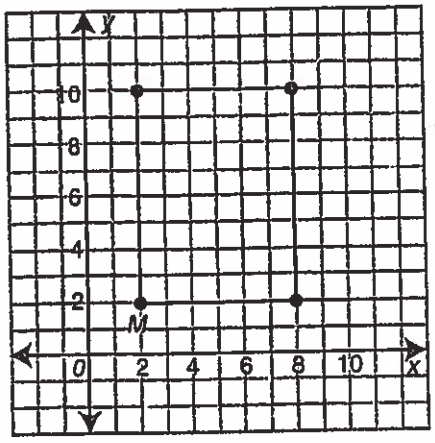
1. The center of dilation is the origin and the scale factor is 2. Use the rule $(x, y) \rightarrow (2x, 2y)$.



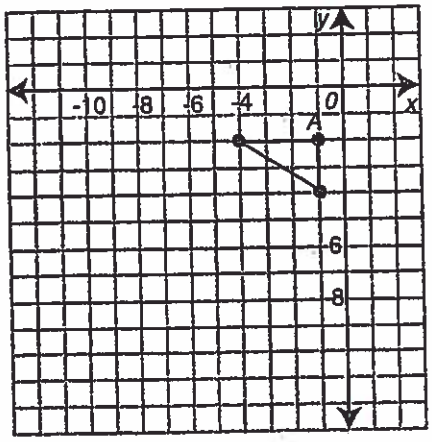
2. The center of dilation is the origin and the scale factor is $\frac{1}{2}$.



3. The center of dilation is point M and the scale factor is $\frac{1}{2}$.



4. The center of dilation is point A and the scale factor is 3.



The following sets of points are the vertices of figures and their dilation images. For each two sets of points, give the scale factor.

5. $A(1, 1)$, $B(2, 6)$, $C(6, 2)$
   $A'(4, 4)$, $B'(8, 24)$, $C'(24, 8)$

_____

6. $R(-3, -9)$, $S(-6, 3)$, $T(-3, 3)$
   $R'(-1, -3)$, $S'(-2, 1)$, $T'(-1, 1)$

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