2.7 Exercises

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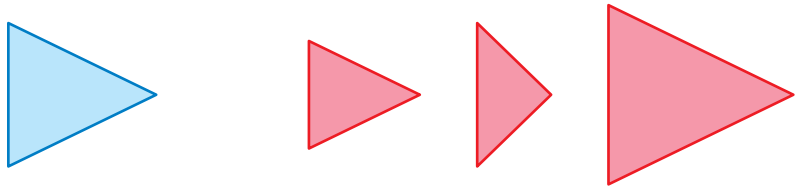
Vocabulary and Concept Check

1. **VOCABULARY** How is a dilation different from other transformations?
2. **VOCABULARY** For what values of scale factor k is a dilation called an *enlargement*? a *reduction*?
3. **REASONING** Which figure is *not* a dilation of the blue figure? Explain.



Practice and Problem Solving

Draw the triangle with the given vertices. Multiply each coordinate of the vertices by 3, and then draw the new triangle. How are the two triangles related?

4. $(0, 2), (3, 2), (3, 0)$
5. $(-1, 1), (-1, -2), (2, -2)$
6. $(-3, 2), (1, 2), (1, -4)$

Tell whether the blue figure is a dilation of the red figure.

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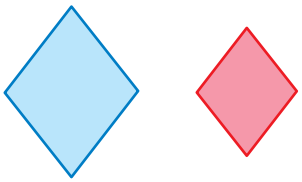
7.



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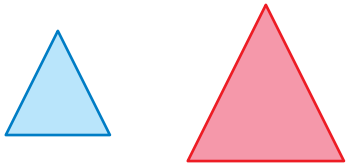

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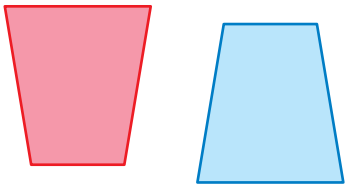

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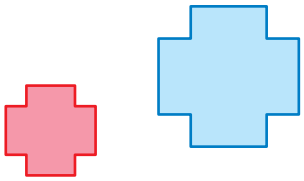

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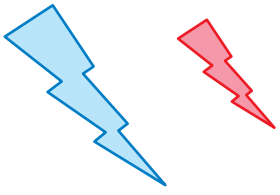

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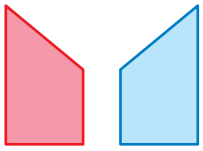


The vertices of a figure are given. Draw the figure and its image after a dilation with the given scale factor. Identify the type of dilation.

2 3

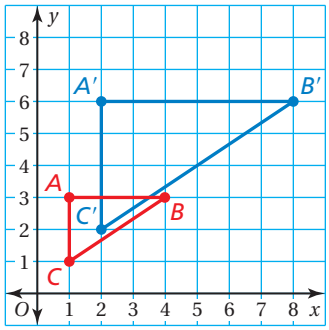
13. $A(1, 1), B(1, 4), C(3, 1); k = 4$
14. $D(0, 2), E(6, 2), F(6, 4); k = 0.5$
15. $G(-2, -2), H(-2, 6), J(2, 6); k = 0.25$
16. $M(2, 3), N(5, 3), P(5, 1); k = 3$
17. $Q(-3, 0), R(-3, 6), T(4, 6), U(4, 0); k = \frac{1}{3}$
18. $V(-2, -2), W(-2, 3), X(5, 3), Y(5, -2); k = 5$

19. ERROR ANALYSIS Describe and correct the error in listing the coordinates of the image after a dilation with a scale factor of $\frac{1}{2}$.

Vertices of ABC	$(2x, 2y)$	Vertices of $A'B'C'$
$A(2, 5)$	$(2 \cdot 2, 2 \cdot 5)$	$A'(4, 10)$
$B(2, 0)$	$(2 \cdot 2, 2 \cdot 0)$	$B'(4, 0)$
$C(4, 0)$	$(2 \cdot 4, 2 \cdot 0)$	$C'(8, 0)$

The blue figure is a dilation of the red figure. Identify the type of dilation and find the scale factor.

20.



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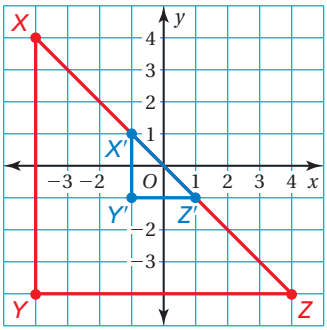

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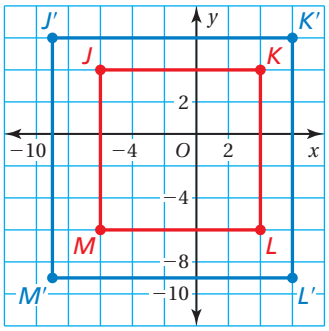


The vertices of a figure are given. Find the coordinates of the figure after the transformations given.

23. $A(-5, 3)$, $B(-2, 3)$, $C(-2, 1)$, $D(-5, 1)$

Reflect in the y-axis. Then dilate with respect to the origin using a scale factor of 2.

24. $F(-9, -9)$, $G(-3, -6)$, $H(-3, -9)$

Dilate with respect to the origin using a scale factor of $\frac{2}{3}$. Then translate 6 units up.

25. $J(1, 1)$, $K(3, 4)$, $L(5, 1)$

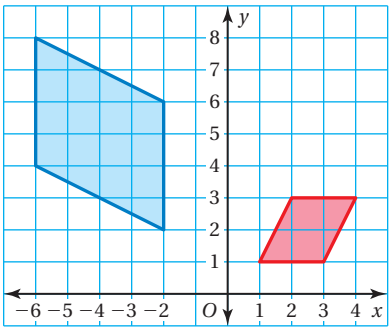
Rotate 90° clockwise about the origin. Then dilate with respect to the origin using a scale factor of 3.

26. $P(-2, 2)$, $Q(4, 2)$, $R(2, -6)$, $S(-4, -6)$

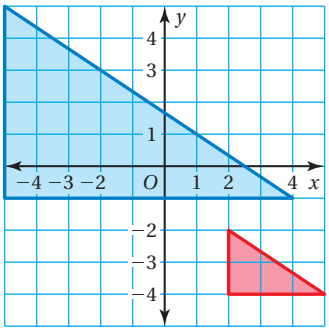
Dilate with respect to the origin using a scale factor of 5. Then dilate with respect to the origin using a scale factor of 0.5.

The red figure is similar to the blue figure. Describe a sequence of transformations in which the blue figure is the image of the red figure.

27.



28.



29. STRUCTURE In Exercises 27 and 28, is the blue figure still the image of the red figure when you perform the sequence in the opposite order? Explain.