Name _____ Date _____ Class _____

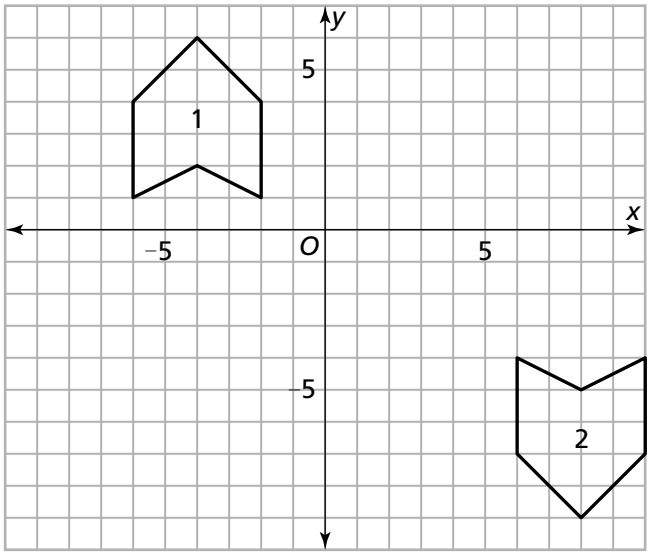
Additional Practice

Investigation 2

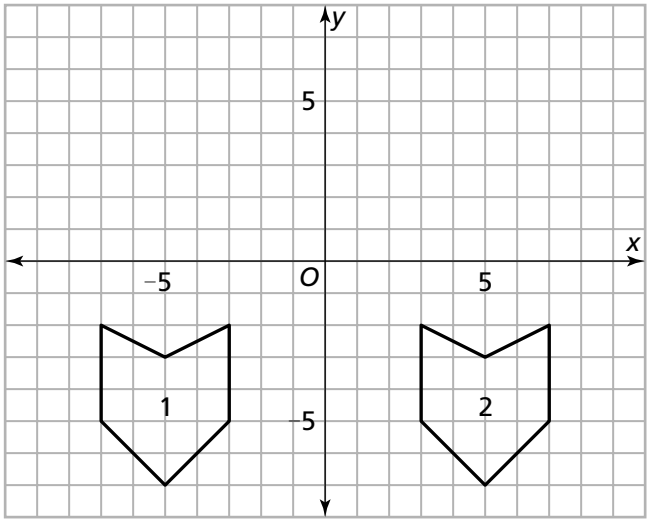
Kaleidoscopes, Hubcaps, and Mirrors

Describe a reflection or a combination of two reflections that would move Shape 1 to exactly match Shape 2.

1.



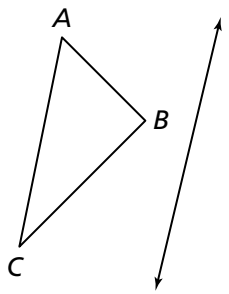
2.



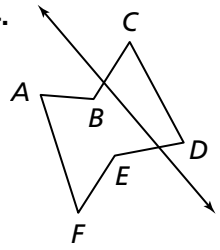
Additional Practice *(continued)*

Draw the image of the polygon under a reflection in the line. Describe what happens to each point on the original polygon under the reflection.

3.



4.

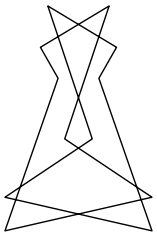


A shape and its image under a line reflection are given. Do parts (a) and (b).

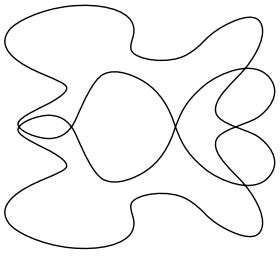
a. Draw the line of symmetry for the figure.

b. Label three points on the figure, and label the corresponding image points.

5.



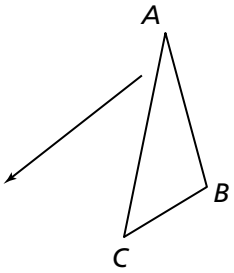
6.



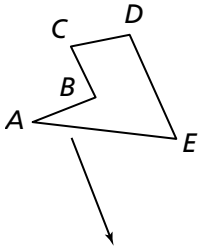
Additional Practice *(continued)*

For Exercises 7 and 8, perform the translation indicated by the arrow. Describe what happens to each point of the original figure under the translation.

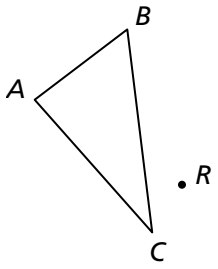
7.



8.

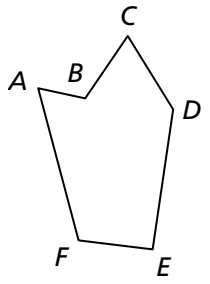


9. Rotate triangle ABC 90° *clockwise* about point R. Describe what happens to each point of triangle ABC under the rotation.

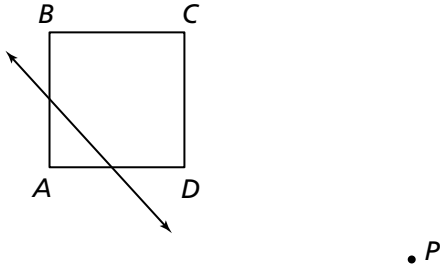


Additional Practice *(continued)*

10. Rotate polygon $ABCDEF$ 180° about point F. Describe what happens to each point of polygon $ABCDEF$ under the rotation.



For Exercises 11-13, refer to this diagram.



11. Draw the image of square $ABCD$ under a reflection in the line.

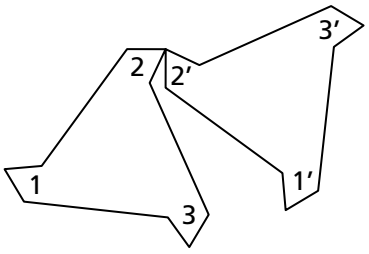
12. Draw the image of square $ABCD$ under a 45° rotation about point D.

13. Draw the image of square $ABCD$ under the translation that slides point D to point P.

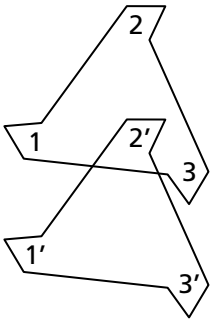
Additional Practice *(continued)*

For Exercises 14–17, a polygon and its image under a transformation are given. Decide whether the transformation was a line reflection, a rotation, or a translation. Then indicate the reflection line, the center and angle of rotation, or the direction and distance of the translation.

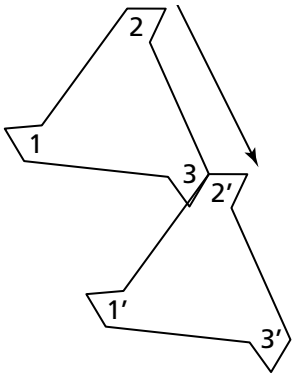
14.



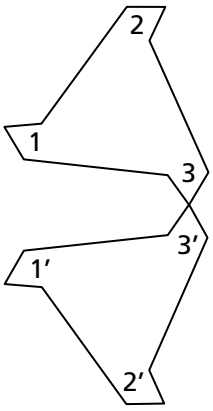
15.



16.



17.

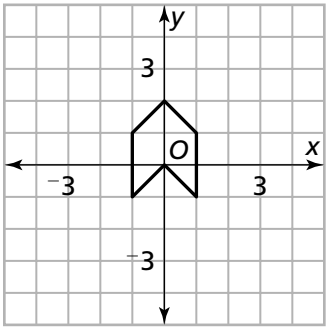


Additional Practice *(continued)*

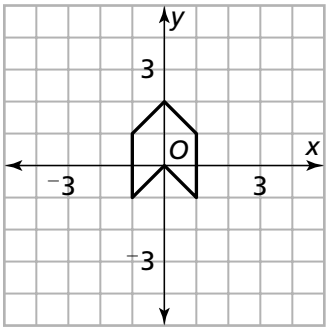
18. Suppose the shape below is translated according to the rolls of a six-sided number cube.

- If a 1, 2, or 3 is rolled, the shape is translated 3 units to the right.
- If a 4 is rolled, the shape is translated 3 units up.
- If a 5 is rolled, the shape is translated 3 units down.
- If a 6 is rolled, the shape is translated 3 units to the left

a. Draw the shape in its location after the following sequence of rolls: 3, 5, 6. What are the new coordinates of a general point (x, y) on the shape after this sequence of rolls?



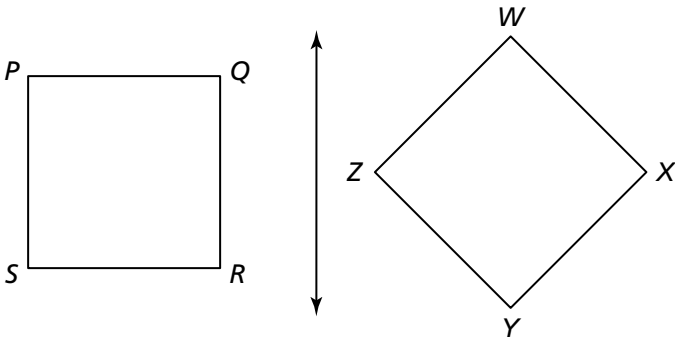
b. Draw the shape in its location after the following sequence of rolls: 1, 6, 4, What are the new coordinates of a general point (x, y) on the shape after this sequence of rolls?



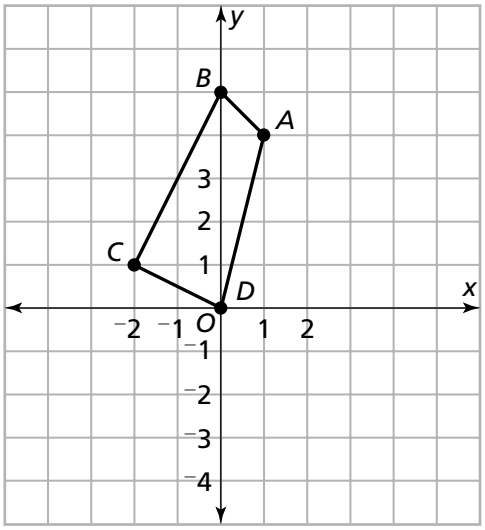
c. What sequence of rolls will produce a final image whose coordinates are all negative?

Additional Practice *(continued)*

19. Describe two different sets of transformations that would move square *PQRS* onto square *WXYZ*.



20. Use the figure below to answer (a)–(g).



a. Write the coordinates of the points A, B, C, D.

b. Write the coordinates of the image of $ABCD$ after a reflection in the x-axis.

c. Write the coordinates of the image of $ABCD$ after a reflection in the y-axis.

d. Write the coordinates of the image of $ABCD$ after a translation of 3 units to the right.

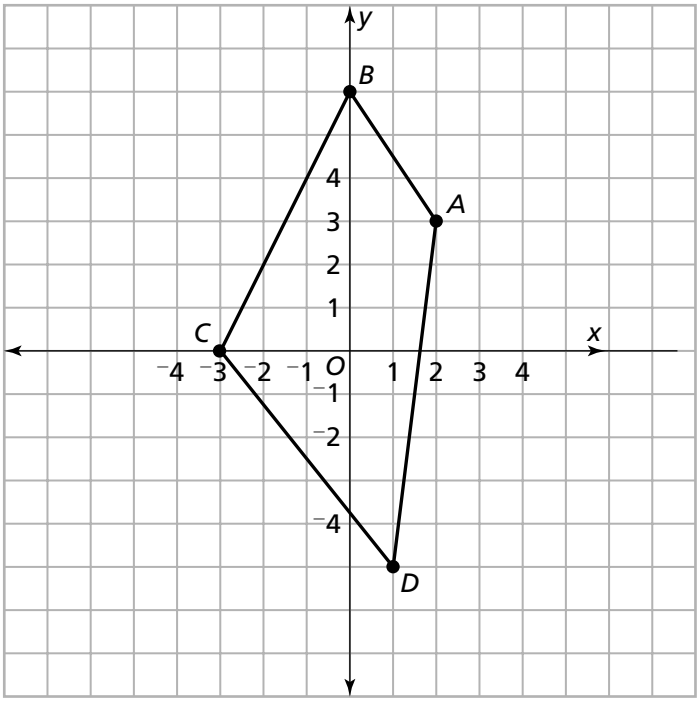
e. Write the coordinates of the image of $ABCD$ after a translation of 4 units to the left.

f. Write the coordinates of the image of $ABCD$ after a translation of 2 units up.

g. Write the coordinates of the image of $ABCD$ after a translation of 1 unit down.

Additional Practice *(continued)*

21. Use the figure below to answer parts (a)–(e).



a. Write the coordinates of the points *A, B, C, D*.

b. Write the coordinates of the image of *ABCD* after a reflection in the line $x = 1$.

c. Write the coordinates of the image of *ABCD* after a reflection in the line $x = -2$.

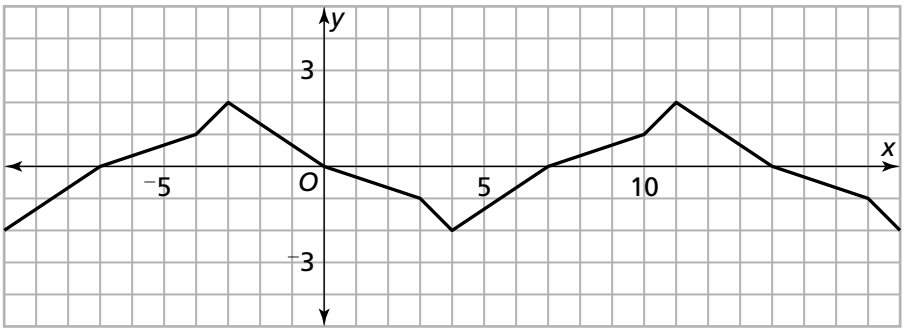
d. Write the coordinates of the image of *ABCD* after a reflection in the line $y = 1$.

e. Write the coordinates of the image of *ABCD* after a reflection in the line $y = -3$.

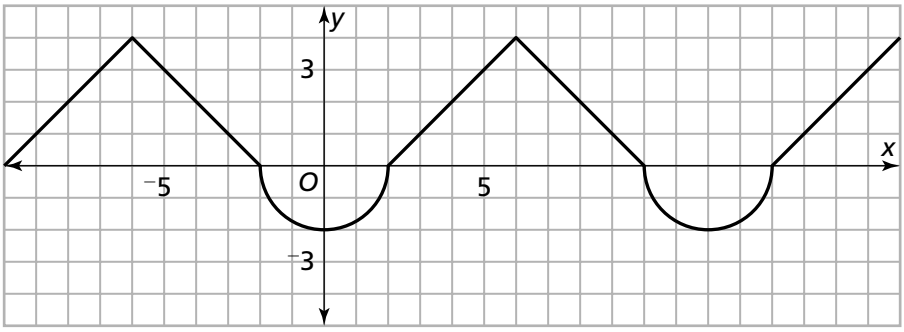
Additional Practice *(continued)*

For Exercises 22 and 23, suppose the pattern in the graph continues in both directions. Identify a basic design element that could be copied and transformed to make the entire pattern, and describe how the pattern could be made from that design element.

22.



23.



24. Plot the points (2, 4), (3, 5), (5, 5), (4, 4), (5, 3), and (3, 3) on a coordinate grid. Form a polygon by connecting the points in order and then connecting the last point to the first point. Reflect the polygon in the *y*-axis. Then translate the image 6 units to the right. Finally, rotate the second image 90° about the origin. What are the coordinates of the vertices of the final image?