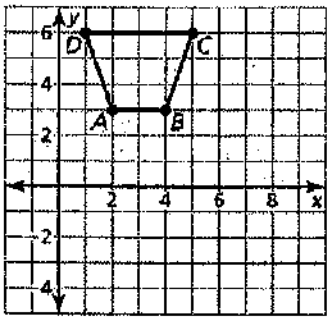
Chapter 4 Review

Use the given translation to find the coordinates of the image of quadrilateral *ABCD*.

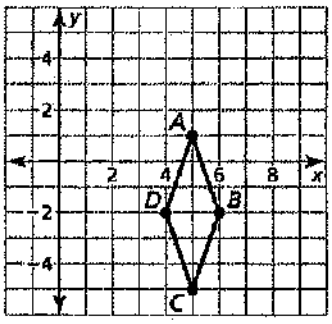
1. $(x, y) \rightarrow (x + 4), (y - 5)$

A'(6, -2)
B'(8, -2)
C'(9, 1)
D'(5, 1)



2. $(x, y) \rightarrow (x - 2), (y + 3)$

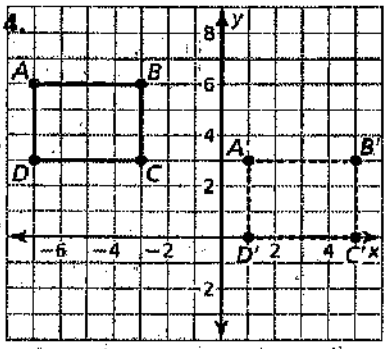
A'(3, 4)
B'(4, 1)
C'(3, -2)
D'(2, 1)



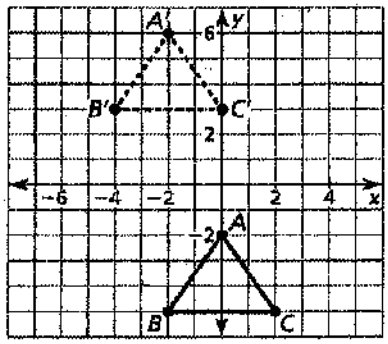
Write a rule for the translation of the preimage to the image.

3

(x, y) → (x + 8, y - 3)



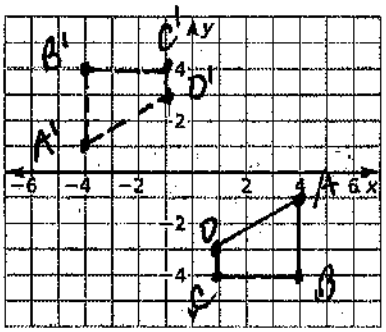
4.



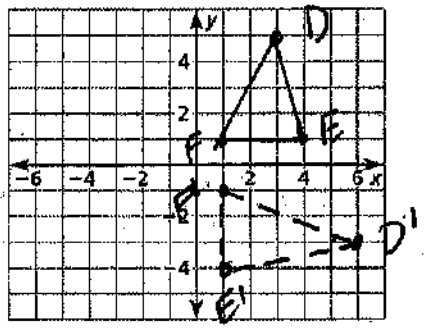
(x, y) → (x - 2, y + 8)

Graph the polygon with the given vertices and its image after a rotation of the given number of degrees clockwise about the origin.

5. $A(4, -1), B(4, -4), C(1, -4), D(1, -3)$; 180°



6. $D(3, 5), E(4, 1), F(1, 1)$; 90°



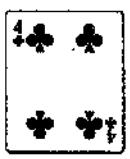
Determine whether the polygons with the given vertices are congruent or similar. Use transformations to explain your reasoning.

7. $A(-6, -3), B(-3, 7), C(2, 5)$ and $E(-7, -1), F(-4, 9), G(1, 7)$ Congruent. Can be mapped by a translation 1 left, 2 up

8. $R(2, 3), S(2, -4), T(-4, 6), U(0, 6)$ and $M(9, 1), N(9, -20), O(-9, 10), P(3, 10)$
Similar. Can be mapped by a dilation w/ SF 3, followed by a translation 3 → 8↓

Determine whether the object has line symmetry and whether it has rotational symmetry. Identify all lines of symmetry and angles of rotation that map the figure into itself.

9.



No LS
Yes RS 180°

10.

Yes LS
Yes RS 180°

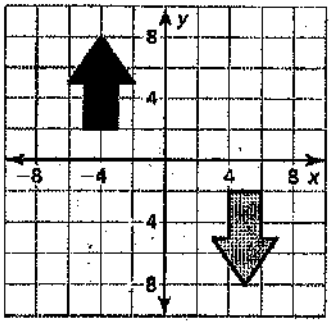
11.

Yes LS
No RS

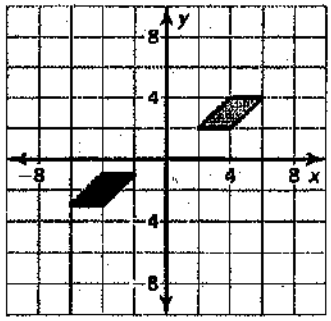
12. $(x, y) \rightarrow (x+9, y)$ then reflect in x-axis

Describe a congruence transformation that maps the black perimage to the grey image.

12.



13.



13. $(x, y) \rightarrow (x-11, y)$ then $(x, y) \rightarrow (x, y-11)$

14. Consider triangle ABC with vertices $A(0, 0)$, $B(0, 4)$, $C(6, 0)$. The image of triangle ABC after a dilation has vertices $A'(0, 0)$, $B'(0, 10)$, $C'(15, 0)$. What is the scale factor of the dilation? $K = 2.5$

15. Triangle ABC with vertices $A(-2, 5)$, $B(1, 8)$, $C(7, 5)$ is dilated using a scale factor of $3\frac{1}{2}$. What are the coordinates of the image of triangle ABC? $A'(-7, 17.5)$ $B'(3.5, 28)$ $C'(24.5, 17.5)$

Describe a similarity transformation that maps the first polygon to the second polygon.

16. $A(-6, -6)$, $B(-6, 3)$, $C(3, 3)$, $D(3, -6)$ and $J(-2, -2)$, $K(-2, 1)$, $L(1, 1)$, $M(1, -2)$ $(x, y) \rightarrow (\frac{1}{3}x, \frac{1}{3}y)$

17. $A(1, 2)$, $B(2, 2)$, $C(1, 4)$ and $D(4, -6)$, $E(6, -6)$, $F(4, -2)$ $(x, y) \rightarrow (x+1, y-5)$ then $(x, y) \rightarrow (2x, 2y)$

In Exercises 18 and 19, graph ΔPQR with vertices $P(-1, 5)$, $Q(-4, 3)$, and $R(-2, 1)$ and its image after the similarity transformation.

18. **Rotation:** 180° about the origin

Dilation: $(x, y) \rightarrow (2x, 2y)$

$P''(2, -10)$, $Q''(8, -6)$, $R''(4, -2)$

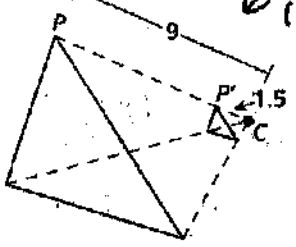
19. **Dilation:** $(x, y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y)$

Reflection: in the x-axis

$P''(-\frac{1}{2}, -2\frac{1}{2})$ $Q''(-2, -1\frac{1}{2})$ $R''(-1, -\frac{1}{2})$

In Exercises 20 and 21, find the scale factor of the dilation. Then tell whether the dilation is a *reduction* or an *enlargement*.

20. $K = \frac{1}{6}$, Reduct.



21. $K = 1.5$, enlargement