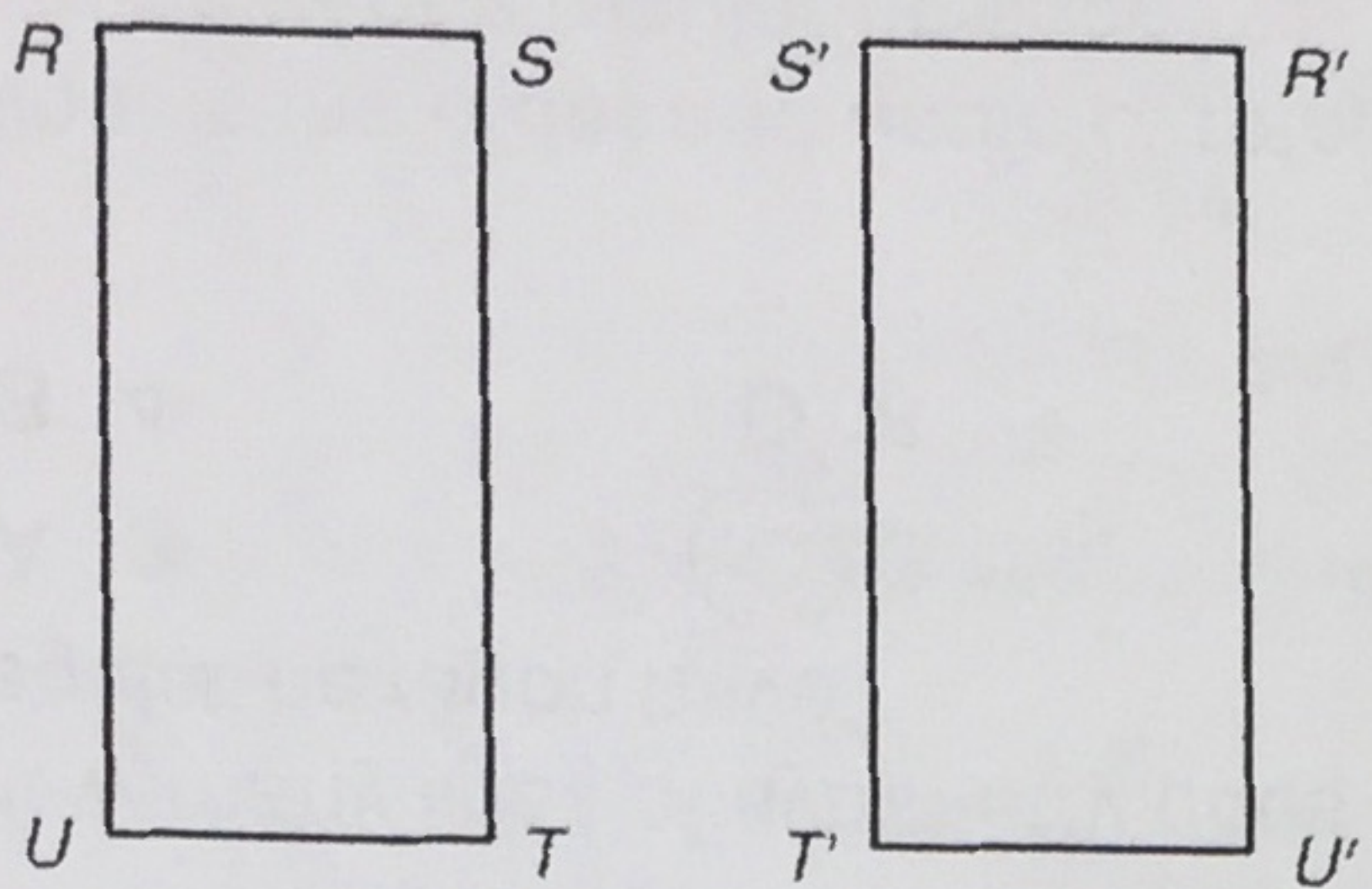


Units 16—17: Study Guide

Select the best answer.

1. Which best describes the transformation?



- A. preimage C. rotation
 B. reflection D. translation

2. A figure has vertices at $K(5, 5)$, $L(5, 3)$, $M(1, 1)$, and $N(3, 5)$. After a transformation, the image of the figure has vertices at $K'(-5, -5)$, $L'(-3, -5)$, $M'(-1, -1)$, and $N'(-5, -3)$. Which best describes the transformation?

- A. preimage C. rotation
 B. reflection D. translation

3. What is the image of $(-8, -1)$ when it is reflected across the line $y = x$?

- A. $(-1, -8)$ C. $(1, 8)$
 B. $(-\frac{1}{8}, -1)$ D. $(-1, -\frac{1}{8})$

4. Which of the following capital letters is a reflection image of itself across a horizontal line?

- A. M C. O
 B. N D. P

5. The vertices of $\triangle PQR$ are $P(10, -6)$, $Q(6, 2)$, and $R(4, -1)$. The triangle is translated along a vector. Which vector places the image of the triangle entirely in Quadrant II?

- A. $\langle -6, 10 \rangle$ C. $\langle -11, 6 \rangle$
 B. $\langle -10, 7 \rangle$ D. $\langle -12, 8 \rangle$



- add the vector to each point in PQR.
 - The x must be neg & the y must be positive

Example $(-6, 10)$
 $P(10, -6) \rightarrow (4, 4)$
 not Q.II

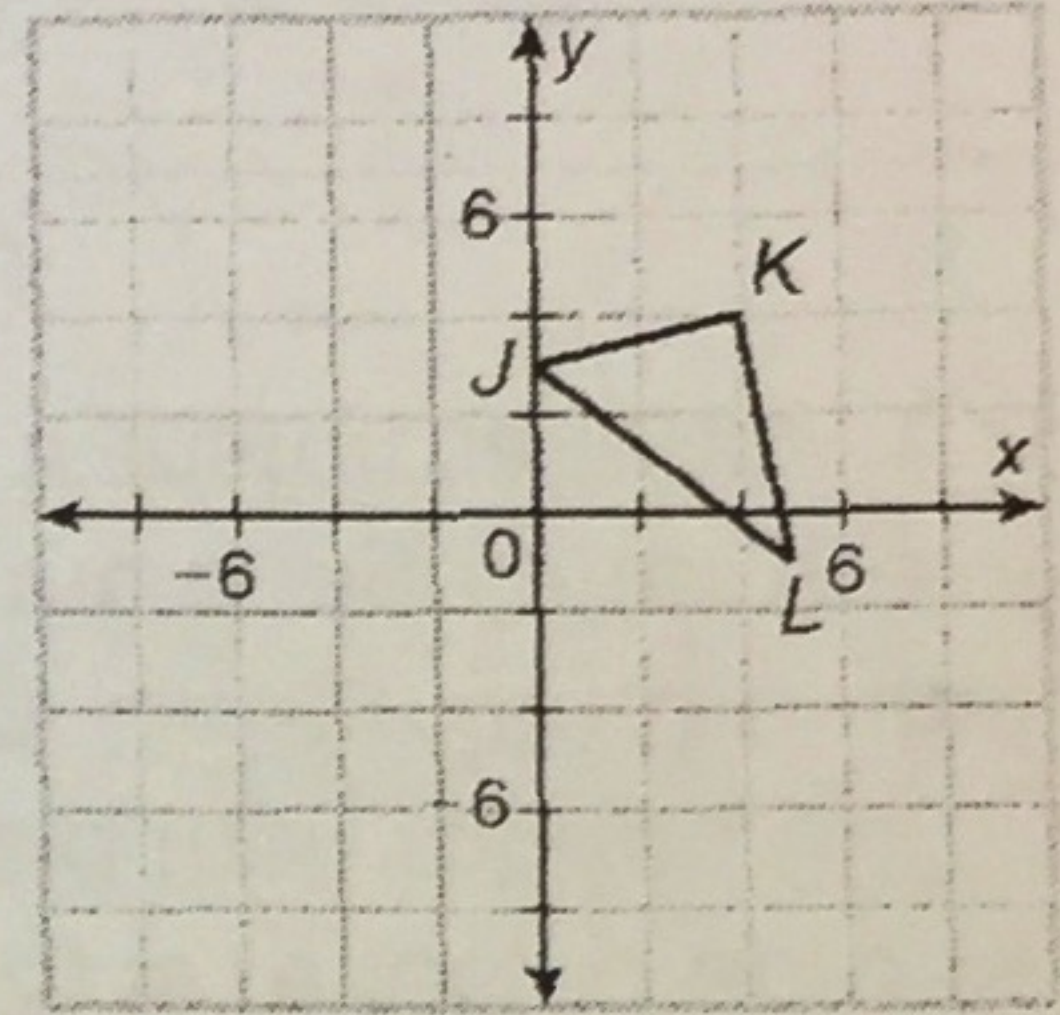
B. $\langle -10, 7 \rangle$
 $P(10, -6) \rightarrow (0, 1)$ NOT Q.II

6. Which shows the image of \swarrow after a 180° rotation about the endpoint of the ray?

- A. \uparrow C. \searrow
 B. \swarrow D. \nwarrow

Use the figure for Exercises 7 and 8.

The coordinates of the vertices are integers.



$J(0, 3)$
 $K(4, 4)$
 $L(5, -1)$

7. $\triangle JKL$ is rotated 90° about the origin and then translated along the vector $\langle -8, 5 \rangle$. What are the coordinates of the final image of point L under this composition of transformations?

- A. $(-7, 10)$ C. $(-9, 10)$
 B. $(-7, 0)$ D. $(-9, 0)$

$L(5, -1)$
 $90^\circ (-1, 5)$
 $V: \langle -8, +5 \rangle$
 $-9, 0$

8. $\triangle JKL$ is translated along the vector $\langle 1, -3 \rangle$ after it is reflected across the x -axis. What are the coordinates of the final image of point J under this composition of transformations?

- A. $(6, -1)$ C. $(1, -6)$
 B. $(-6, 1)$ D. $(-1, 6)$

$J(0, 3)$
 Ref $(0, -3)$
 $V: \langle +1, -3 \rangle$
 $1, -6$

9. The composition of two reflections across two intersecting lines is equivalent to which isometry?

- A. rotation C. translation
 B. glide rotation D. reflection

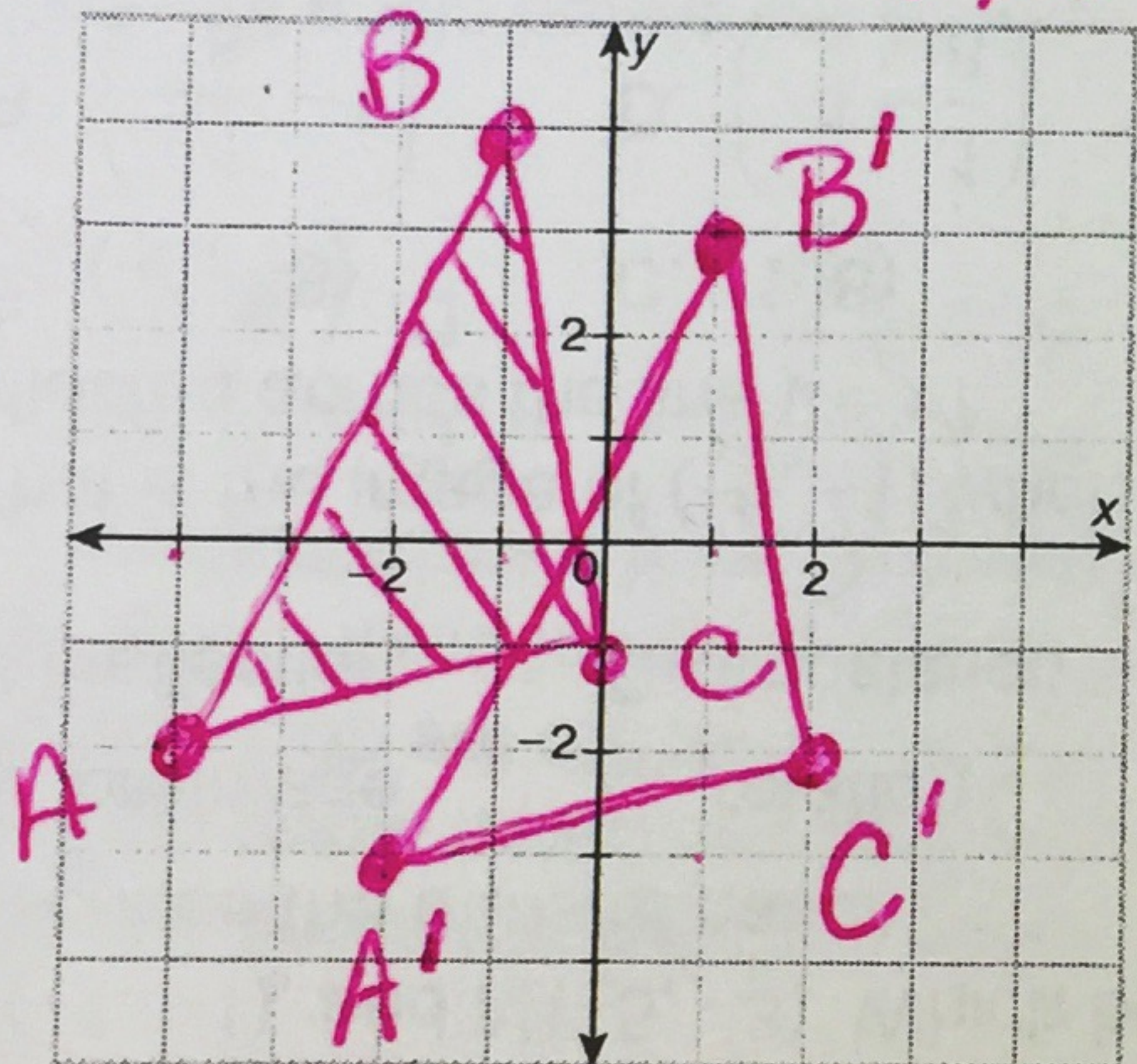
10. A triangle has vertices at $A(-2, 3)$, $B(2, 1)$, and $C(1, 0)$. After a transformation, the image of the triangle has vertices at $A'(-2, -3)$, $B'(2, -5)$, and $C'(1, -6)$. Identify the transformation.

$(x, y) \rightarrow (x, y - 6)$
translate down 6

11. Identify the image of the point $A(-6, -9)$ when A is reflected across the line $y = x$.

$A'(-9, -6)$

12. $\triangle ABC$ has vertices $A(-4, -2)$, $B(-1, 4)$, and $C(0, -1)$. Draw $\triangle ABC$ and its image $\triangle A'B'C'$ for translation along the vector $\langle 2, -1 \rangle$. $A'(-2, -3)$ $B'(1, 3)$ $C'(2, -2)$



13. Use mapping notation to represent a 90° clockwise rotation about the origin of the point (x, y) .

$(x, y) \rightarrow (y, -x)$

14. How many lines of symmetry does a regular hexagon have?

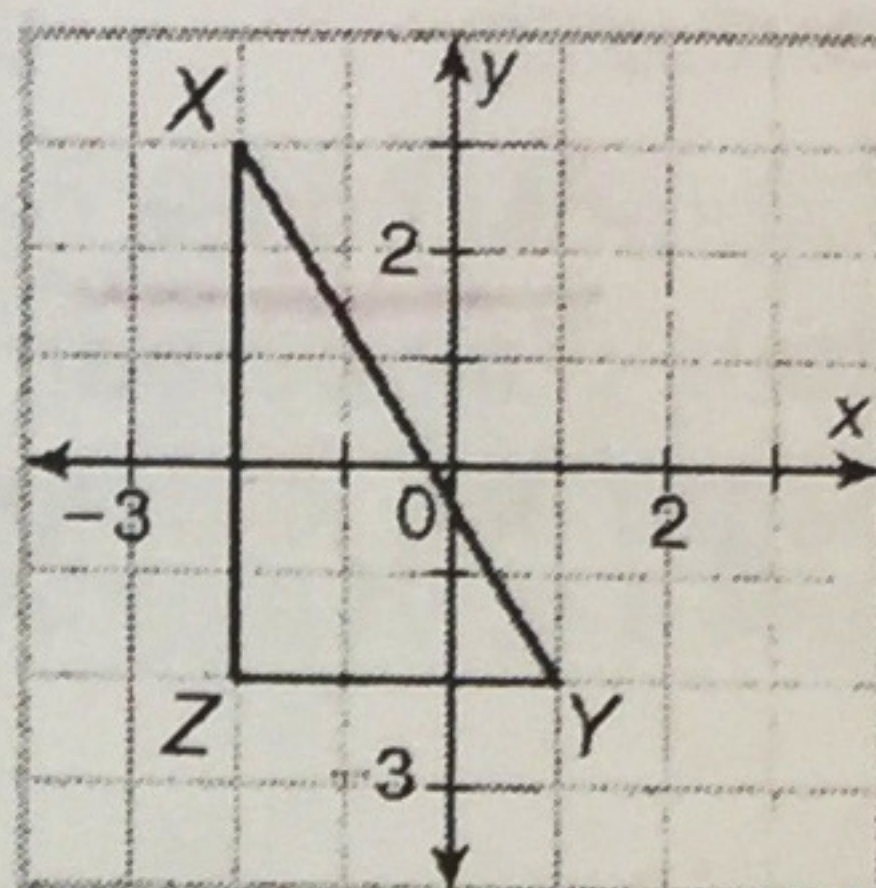
A. 3 C. 6
 B. 4 D. 8

15. What is the order and angle of rotational symmetry of a regular octagon?

A. 8; 45° C. 4; 90°
 B. 16; 45° D. 8; 90°

$\frac{360}{8}$

16. $\triangle XYZ$ is reflected across the y -axis. Then its image is rotated 90° about the origin. What are the coordinates of the final image of point X under the composition of transformations?



$X(-2, 3)$
 Ref $(2, 3)$

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

sometimes try both 90° clockwise (answer not there)
 90° counter $(-3, 2)$

17. Which are equivalent to a composition of two reflections?

~~I.~~ reflection II. rotation *intersecting lines*
 III. translation *parallel lines* ~~IV.~~ glide reflection

A. I and II
B. II and III
 C. I and IV
 D. I, II, and III

$y = 1$
 $\downarrow -4$
 $(2, -3)$

18. The point $(2, -3)$ is reflected across the line $y = 1$ and then rotated 90° about the origin. Determine the final coordinates of the image after the composition of transformations.

$(5, -2)$

19. After a translation, the image of $K(-4, 7)$ is $K'(5, -3)$. Find the image of $K(1, -2)$ after this same translation. *Trans $(9, -10)$*

$(1, -2) \rightarrow (10, -12)$

20. What is the image of $X(3, 5)$ along the translation vector $\langle -4, 6 \rangle$?

$X'(-1, 11)$