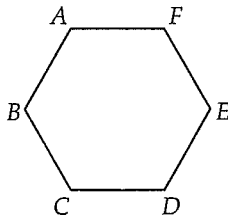


side A

7 The transformation that moves every point in the plane under the rule $(x, y) \rightarrow (-y, x)$ is a:

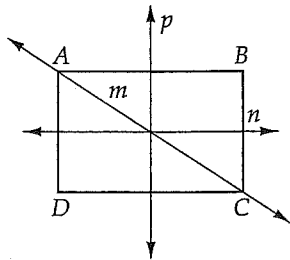
- (1) rotation
- (2) reflection in the x -axis
- (3) dilation
- (4) point reflection

8 Using the diagram of a regular polygon below, find $R_{-120^\circ} \circ R_{180^\circ} \circ R_{240^\circ}(B)$.



- (1) A
- (2) B
- (3) E
- (4) F

9 In this figure, p , m , and n are lines of reflection. Find $r_p \circ r_n \circ r_m(D)$.



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

10 If point $M(-5, 8)$ is reflected in the line $y = 2$, what are the coordinates of M' ?

- (1) $(-5, 10)$
- (2) $(-5, -4)$
- (3) $(9, -4)$
- (4) $(-3, 10)$

11 A transformation maps $(1, 3)$ onto $(-3, -1)$. This transformation is equivalent to a:

- (1) rotation of 90°
- (2) reflection in the origin
- (3) reflection in the line $y = -x$
- (4) translation of $-3, -1$

12 Which of these transformations would alter the perimeter of a triangle?

- (1) $(x, y) \rightarrow (x + 2, y - 3)$
- (2) $(x, y) \rightarrow (4x, 2y)$
- (3) $(x, y) \rightarrow (x, -y)$
- (4) $(x, y) \rightarrow (y, -x)$

13 If the point $(0, -4)$ is rotated 90° clockwise about the origin, its image is on the line:

- (1) $y = x$
- (2) $y = -x$
- (3) $x = 0$
- (4) $y = 0$

14 Which of the following compositions is a direct isometry?

- (1) $R_{90^\circ} \circ r_{x\text{-axis}}$
- (2) $r_{y=x} \circ T_{-3, 4}$
- (3) $r_{x=1} \circ r_{y\text{-axis}}$
- (4) $D_2 \circ r_{y=x}$

15 If the dilation D_k of point $A(4, -8)$ is $A'(-2, 4)$, the dilation factor k equals:

- (1) $-\frac{1}{2}$
- (2) $\frac{1}{2}$
- (3) 2
- (4) 4

16 Look at the figure below.



If the figure is rotated 90° counterclockwise and then reflected in the y -axis, its image would be which of the following?

- (1)
- (2)
- (3)
- (4)

Side B

3 $R_O \circ R_O(x, y)$ would result in a point whose coordinates are:

- (1) (x, y)
- (2) $(-x, y)$
- (3) $(x, -y)$
- (4) (y, x)

4 Which composition would produce an image triangle whose area is *not* equal to the area of the original triangle?

- (1) $r_{y\text{-axis}} \circ r_{x\text{-axis}}$
- (2) $T_{2, -3} \circ r_{y=x}$
- (3) $r_{y=-x} \circ D_3$
- (4) $R_O \circ R_O$

5 $r_{y=x} \circ r_{x\text{-axis}}$ produces a transformation that is:

- (1) a direct isometry
- (2) an opposite isometry
- (3) an isometry that is both direct and opposite
- (4) not an isometry

6 $D_2 \circ D_{\frac{1}{2}}(x, y) =$

- (1) $(2x, 2y)$
- (2) (x, y)
- (3) $(\frac{1}{2}x, \frac{1}{2}y)$
- (4) $(\frac{1}{4}x, \frac{1}{4}y)$

7 What is $r_{y=2} \circ r_{x\text{-axis}}(-3, 4)$?

- (1) $(-3, 0)$
- (2) $(-3, 2)$
- (3) $(-3, 4)$
- (4) $(-3, 8)$

8 Given square $ABCD$ labeled counterclockwise. What is $R_{90^\circ} \circ R_{180^\circ}(A)$?

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

9 Which of the following is equivalent to $T_{2,4} \circ T_{2,-4}$?

- (1) $T_{4,8}$
- (2) $T_{4,-16}$
- (3) $T_{4,0}$
- (4) $T_{0,-8}$

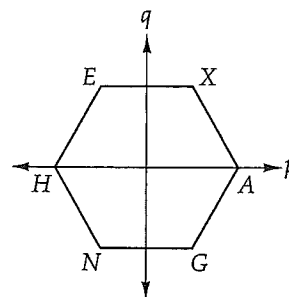
10 $r_{y=x} \circ r_{y=x}(x, y) =$

- (1) (x, y)
- (2) $(-x, y)$
- (3) $(x, -y)$
- (4) (y, x)

11 Which property is *not* preserved under a glide reflection?

- (1) distance
- (2) angle measure
- (3) orientation
- (4) parallelism

12 In the given figure, p and q are lines of symmetry for regular hexagon $HEXAGN$. Find $r_q \circ r_p(X)$.



4 If the coordinates of Q are $(-2, 5)$, what are the coordinates of $(r_{y\text{-axis}} \circ R_{90^\circ})(Q)$?

- (1) $(-2, -5)$
- (2) $(-5, 2)$
- (3) $(5, -2)$
- (4) $(2, -5)$

5 Which of the following is *not* an isometry?

- (1) $(x, y) \rightarrow (-y, x)$
- (2) $(x, y) \rightarrow (-4 + x, y + 3)$
- (3) $(x, y) \rightarrow (x, 2y)$
- (4) $(x, y) \rightarrow (-x, y)$

6 If line a is parallel to line b , then $r_a \circ r_b(\triangle CTH)$ is equivalent to a:

- (1) translation
- (2) rotation
- (3) dilation
- (4) reflection in $y = x$