

**G.G.54: Compositions of Transformations 1: Define, investigate, justify, and apply isometries in the plane (rotations, reflections, translations, glide reflections)**

- 1 The point  $(3, -2)$  is rotated  $90^\circ$  about the origin and then dilated by a scale factor of 4. What are the coordinates of the resulting image?
  - 1)  $(-12, 8)$
  - 2)  $(12, -8)$
  - 3)  $(8, 12)$
  - 4)  $(-8, -12)$
- 2 What is the image of point  $A(4, 2)$  after the composition of transformations defined by  $R_{90^\circ} \circ r_{y=x}$ ?
  - 1)  $(-4, 2)$
  - 2)  $(4, -2)$
  - 3)  $(-4, -2)$
  - 4)  $(2, -4)$
- 3 What is the image of point  $(1, 1)$  under  $r_{x\text{-axis}} \circ R_{0, 90^\circ}$ ?
  - 1)  $(1, 1)$
  - 2)  $(1, -1)$
  - 3)  $(-1, 1)$
  - 4)  $(-1, -1)$
- 4 What are the coordinates of point  $A'$ , the image of point  $A(-4, 1)$  after the composite transformation  $R_{90^\circ} \circ r_{y=x}$  where the origin is the center of rotation?
  - 1)  $(-1, -4)$
  - 2)  $(-4, -1)$
  - 3)  $(1, 4)$
  - 4)  $(4, 1)$
- 5 The coordinates of  $\triangle JRB$  are  $J(1, -2)$ ,  $R(-3, 6)$ , and  $B(4, 5)$ . What are the coordinates of the vertices of its image after the transformation  $T_{2, -1} \circ r_{y\text{-axis}}$ ?
  - 1)  $(3, 1), (-1, -7), (6, -6)$
  - 2)  $(3, -3), (-1, 5), (6, 4)$
  - 3)  $(1, -3), (5, 5), (-2, 4)$
  - 4)  $(-1, -2), (3, 6), (-4, 5)$
- 6 If the coordinates of point  $P$  are  $(2, -3)$ , then  $(R_{90^\circ} \circ R_{180^\circ})(P)$  is
  - 1)  $(-2, 3)$
  - 2)  $(-2, -3)$
  - 3)  $(3, -2)$
  - 4)  $(-3, -2)$
- 7 Find the coordinates of  $r_{y\text{-axis}} \circ r_{y=x}(A)$  if the coordinates of  $A$  are  $(6, 1)$ .
- 8 Find the coordinates of the image of  $(2, 4)$  under the transformation  $r_{y\text{-axis}} \circ T_{3, -5}$ .
- 9 What is the image that results from this composition of transformations?  
 $r_{x\text{-axis}} \circ R_{0, 90^\circ}(-3, 0)$
- 10 Find the coordinates of point  $N(-1, 3)$  under the composite  $r_{y\text{-axis}} \circ R_{90^\circ}$ .
- 11 If the coordinates of  $A$  are  $(2, -3)$ , what are the coordinates of  $A'$ , the image of  $A$  after  $R_{90^\circ} \circ r_{y\text{-axis}}(A)$ ?
- 12 If the coordinates of  $B$  are  $(1, -5)$ , what are the coordinates of  $B'$ , the image of  $B$  after  $R_{90^\circ} \circ r_{x\text{-axis}} B$ ?
- 13 Find the image of point  $A(3, -2)$  under the composition of translations  $T_{2, 1} \circ T_{-6, -4}$ .
- 14 Which transformation is equivalent to the composite line reflections  $r_{y\text{-axis}} \circ r_{y=x}(\overline{AB})$ ?
  - 1) a rotation
  - 2) a dilation
  - 3) a translation
  - 4) a glide reflection
- 15 Write a single translation that is equivalent to  $T_{3, -1}$  followed by  $T_{-5, 5}$ .

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## **Answer Section**

1 ANS: 3

$(3, -2) \rightarrow (2, 3) \rightarrow (8, 12)$

REF: 011126ge

2 ANS: 1

REF: 011023ge

3 ANS: 4

REF: 080413b

4 ANS: 4

REF: 010618b

5 ANS: 3

REF: 080715b

6 ANS: 4

REF: 010028siii

7 ANS:

$(-1, 6)$

REF: 088611siii

8 ANS:

$(-5, -1)$

REF: 089340siii

9 ANS:

$(0, 3)$

REF: 069514siii

10 ANS:

$(3, -1)$

REF: 019613siii

11 ANS:

$(3, -2)$

REF: 089714siii

12 ANS:

$(-5, 1)$

REF: 010112siii

13 ANS:

$(-1, -5)$

REF: 060307siii

14 ANS: 1

REF: 018634siii

15 ANS:

$T_{-2, 4}$

REF: 019816siii