

See ANSWERS below.

Write rules representing the following:

1. $r_{y=x} \circ T_{4,-2}$

2. $T_{-3,4} \circ R_{270^\circ}$

3. $r_{y\text{-axis}} \circ R_{180^\circ}$

Write the rules that represent the composite transformations given below:

4. rotate 90 degrees about the origin, then reflect over the line $y = -x$

5. translate up 8 and left 6 units, then dilate with a scale factor of $1/2$ centered at the origin

6. reflect over the x-axis, then translate up 3 units

Given the rule, describe the composition (in words) and give the composition notation that describes the composite transformations below:

7. $(x, y) \longrightarrow (-(x + 3), (y + 4))$

8. $(x, y) \longrightarrow (-(y - 9), (x + 2))$

9. $(x, y) \longrightarrow (-(y - 1), -x)$

10. $(x, y) \longrightarrow (x - 9, -(y + 3))$

Answers in red.

1. Translate right 4 and down 2, followed by a reflection over the line $y = x$.
2. Rotate 270 degrees centered at the origin, followed by a translation left 3 and up 4.
3. Rotate 180 degrees centered at the origin, followed by a reflection over the y -axis.
4. $(x, y) \rightarrow (-x, y)$

Rotate 90 then Reflect $y = -x$

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

$$5. (x, y) \rightarrow (1/2x - 3, 1/2y + 4)$$

Translate $(x-6, y+8)$ then Dilate $\frac{1}{2}$

$$(x-6, y+8) \rightarrow (1/2(x-6), 1/2(y+8)) \rightarrow (1/2x - 3, 1/2y + 4)$$

$$6. (x, y) \rightarrow (x, -y+3)$$

Reflect x then Translate $(x, y+3)$

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

7. Translate right 3 and up 4, followed by a reflection over the y -axis

$$r_{y\text{-axis}} \circ T_{3, 4}$$

8. Translate right 2 and down 9, followed by a 90 degree rotation centered at the origin

$$R_{90 \text{ degrees}} \circ T_{2, -9}$$

9. Translate down 1, followed by a reflection over the line $y = -x$

$$r_{y=-x} \circ T_{0, -1}$$

10. Translate left 9 and up 3, followed by a reflection over the x -axis

$$r_{x\text{-axis}} \circ T_{-9, 3}$$