

Coordinate Move Lab

Track rigid transformations on the coordinate plane.

HIGH SCHOOL • HSG-CO.A

CCSS.Math.Content.HSG-CO.A "Experiment with transformations in the plane"

NAME _____

DATE _____

RIGID MOVES

Rigid transformations, translations, reflections, and rotations, move a figure without changing its side lengths or angle measures. A translation adds the same horizontal and vertical change to every point. Reflections and rotations also keep a figure congruent, but their coordinate rules depend on the line of reflection or the center and direction of rotation.

WORKED EXAMPLE

Translate $R(-3, 8)$ by $(7, -5)$.

1. Start at $R(-3, 8)$.
2. Add 7 to the x-coordinate: $-3 + 7 = 4$.
3. Add -5 to the y-coordinate: $8 + (-5) = 3$.

Answer: $R'(4, 3)$

PRACTICE 6 problems

- 1** Translate $A(2, 10)$ by $(-1, -9)$.

ANSWER _____

- 2** Reflect $B(-6, 1)$ across the y-axis.

ANSWER _____

- 3** Reflect $C(9, -2)$ across the x-axis.

ANSWER _____

- 4** Rotate $D(1, 6)$ 90 degrees clockwise about the origin.

ANSWER _____

- 5** Rotate $E(-9, 2)$ 180 degrees about the origin.

ANSWER _____

- 6** Reflect $N(2, 9)$ across the line $y = x$.

ANSWER _____

APPLY IT Show your work

- 1** A student is designing an esports logo on a coordinate grid. One corner of the logo is $M(12, 10)$. The student moves the entire logo 2 units left and 1 unit down. What are the coordinates of M' ?

WORK SPACE

ANSWER _____

- 2** A student rotates a sticker graphic for a laptop design. A point on the graphic is at $(2, -6)$, and the graphic rotates 90 degrees counterclockwise about the origin. What are the coordinates of the image point?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Point $Q(12, 1)$ is translated 2 units left and 9 units up. Then Q' is reflected across the y -axis. Find Q'' and show the coordinate change after each transformation.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Translate A(2, 10) by (-1, -9).	A'(1, 1)
2	Reflect B(-6, 1) across the y-axis.	B'(6, 1)
3	Reflect C(9, -2) across the x-axis.	C'(9, 2)
4	Rotate D(1, 6) 90 degrees clockwise about the origin.	D'(6, -1)
5	Rotate E(-9, 2) 180 degrees about the origin.	E'(9, -2)
6	Reflect N(2, 9) across the line $y = x$.	N'(9, 2)

PART 2 • APPLY IT

1. **M'(10, 9)** Subtract 2 from the x-coordinate and subtract 1 from the y-coordinate. The image point is M'(10, 9).
2. **(6, 2)** For a 90-degree counterclockwise rotation about the origin, use $(x, y) \rightarrow (-y, x)$. Applying the rule to (2, -6) gives (6, 2).

CHALLENGE

After the translation, Q' = (10, 10). After reflecting across the y-axis, Q'' = (-10, 10).

Accept equivalent coordinate notation, including ordered pairs without point labels. For rotations, require the stated direction and center to be used correctly.