

Move It Exactly

Track coordinates and test what stays the same.

GRADE 8 • 8.G.A.1

CCSS.Math.Content.8.G.A.1 "Verify experimentally the properties of rotations, reflections, and translations:"

NAME _____

DATE _____

TRANSFORMATION RULES

A translation moves every point by the same horizontal and vertical change. Rotations and reflections change position or direction, but they keep lengths and angle measures the same.

WORKED EXAMPLE

Translate $M(1, -2)$ by $\langle 4, 3 \rangle$.

1. Add 4 to the x-coordinate: $1 + 4 = 5$.

2. Add 3 to the y-coordinate: $-2 + 3 = 1$.

Answer: $M' = (5, 1)$.

PRACTICE 5 problems

1 Translate $A(-6, 7)$ by $\langle 8, -9 \rangle$.

ANSWER _____

2 Reflect $B(-7, 6)$ across the y-axis.

ANSWER _____

3 Rotate $C(6, -8)$ 90 degrees counterclockwise about the origin.

ANSWER _____

4 Segment DE has endpoints $D(0, 7)$ and $E(8, 7)$. Translate it by $\langle -6, -9 \rangle$. Find D' , E' , and the image length.

ANSWER _____

5 Angle JKL measures 80 degrees. It is reflected across the x-axis. What is the image angle measure?

ANSWER _____

APPLY IT Show your work

- 1** In a video game, your player is at $(-8, 9)$. The player moves 11 units right and 6 units down. What is the new location?

WORK SPACE

ANSWER _____

- 2** A dance app rotates a pose marker at $(-7, -6)$ 90 degrees clockwise about the origin. What are the new coordinates?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Triangle PQR has $P(6, 7)$, $Q(9, 7)$, and $R(6, 8)$. Rotate it 90 degrees counterclockwise about the origin, then translate it by $\langle 8, -9 \rangle$. Find P' , Q' , and R' . Explain which measurements are preserved.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Translate A(-6, 7) by $\langle 8, -9 \rangle$.	A' = (2, -2).
2	Reflect B(-7, 6) across the y-axis.	B' = (7, 6).
3	Rotate C(6, -8) 90 degrees counterclockwise about the origin.	C' = (8, 6).
4	Segment DE has endpoints D(0, 7) and E(8, 7). Translate it by $\langle -6, -9 \rangle$. Find D', E', and the image length.	D' = (-6, -2), E' = (2, -2), and D'E' = 8 units.
5	Angle JKL measures 80 degrees. It is reflected across the x-axis. What is the image angle measure?	80 degrees.

PART 2 • APPLY IT

- (3, 3)** Add 11 to the x-coordinate and subtract 6 from the y-coordinate.
- (-6, 7)** For a 90-degree clockwise rotation, use (x, y) to get (y, -x).

CHALLENGE

P' = (1, -3), Q' = (1, 0), and R' = (0, -3). Side lengths and angle measures are preserved.

Accept equivalent coordinate notation. For explanations, accept any correct statement that rotations and translations preserve lengths and angle measures.