

Coordinate Move Lab

Plot each image after every move.

HIGH SCHOOL • MA.912.GR.2.5

MA.912.GR.2.5 "Given a geometric figure and a sequence of transformations, draw the transformed figure on a coordinate plane."

NAME _____

DATE _____

TRACK EACH MOVE

Apply the transformations in the order given. For a translation $\langle a, b \rangle$, add a to each x -coordinate and b to each y -coordinate.

WORKED EXAMPLE

Triangle $A(7,9)$, $B(10,12)$, $C(8,14)$ is reflected across the x -axis, then translated $\langle 20, 30 \rangle$. Find the image.

1. Reflect across the x -axis: $A(7,-9)$, $B(10,-12)$, $C(8,-14)$.
2. Add 20 to each x -coordinate.
3. Add 30 to each y -coordinate.

Answer: $A'(27,21)$, $B'(30,18)$, $C'(28,16)$

PRACTICE 5 problems

- 1** Plot triangle $A(-2,3)$, $B(1,3)$, $C(0,5)$ after a translation $\langle 4, -2 \rangle$. List the image vertices.

ANSWER _____

- 2** Plot rectangle $P(-4,-1)$, $Q(-1,-1)$, $R(-1,2)$, $S(-4,2)$ after a reflection across the y -axis. List the image vertices.

ANSWER _____

- 3** Plot triangle $D(2,-3)$, $E(4,-3)$, $F(2,-1)$ after a 90 degrees counterclockwise rotation about the origin, then a translation $\langle -1, 2 \rangle$. List the image vertices.

ANSWER _____

- 4** Plot quadrilateral $G(1,1)$, $H(4,1)$, $I(3,4)$, $J(2,4)$ after a 180 degrees rotation about the origin, then a reflection across the y -axis. List the image vertices.

ANSWER _____

- 5** Plot triangle $K(-3,1)$, $L(-1,1)$, $M(-2,3)$ after a dilation centered at the origin with scale factor 2, then a reflection across the x -axis. List the image vertices.

ANSWER _____

APPLY IT Show your work

- 1** A gaming club logo is triangle $A(-3,2)$, $B(-1,2)$, $C(-2,4)$. The design software rotates it 90 degrees clockwise about the origin, then translates it $\langle 1,-1 \rangle$. Plot and list the final vertices.

WORK SPACE

ANSWER _____

- 2** A dance team marks a floor path with $P(-4,-2)$, $Q(-1,-2)$, $R(-1,1)$, $S(-3,1)$. The path is reflected across $y=x$, then translated $\langle -2,3 \rangle$. Plot and list the final vertices.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Triangle $X(-2,1)$, $Y(1,2)$, $Z(2,-2)$ is rotated 90 degrees counterclockwise about the origin, reflected across the x-axis, then translated $\langle 3,-2 \rangle$. List the final vertices. Is the final triangle congruent to the original? Explain.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Plot triangle A(-2,3), B(1,3), C(0,5) after a translation $\langle 4, -2 \rangle$. List the image vertices.	A'(2,1), B'(5,1), C'(4,3)
2	Plot rectangle P(-4,-1), Q(-1,-1), R(-1,2), S(-4,2) after a reflection across the y-axis. List the image vertices.	P'(4,-1), Q'(1,-1), R'(1,2), S'(4,2)
3	Plot triangle D(2,-3), E(4,-3), F(2,-1) after a 90 degrees counterclockwise rotation about the origin, then a translation $\langle -1, 2 \rangle$. List the image vertices.	D'(2,4), E'(2,6), F'(0,4)
4	Plot quadrilateral G(1,1), H(4,1), I(3,4), J(2,4) after a 180 degrees rotation about the origin, then a reflection across the y-axis. List the image vertices.	G'(1,-1), H'(4,-1), I'(3,-4), J'(2,-4)
5	Plot triangle K(-3,1), L(-1,1), M(-2,3) after a dilation centered at the origin with scale factor 2, then a reflection across the x-axis. List the image vertices.	K'(-6,-2), L'(-2,-2), M'(-4,-6)

PART 2 • APPLY IT

- A'(3,2), B'(3,0), C'(5,1)** Rotate clockwise using (x,y) to (y,-x), then add 1 to each x-coordinate and subtract 1 from each y-coordinate.
- P'(-4,-1), Q'(-4,2), R'(-1,2), S'(-1,0)** Swap each point's coordinates for the reflection across $y=x$, then add -2 to x and 3 to y.

CHALLENGE

X'(2,0), Y'(1,-3), Z'(5,-4). Yes, it is congruent because rotations, reflections, and translations preserve side lengths and angle measures.

Accept correctly plotted figures with matching labeled vertices. Equivalent ordered transformation work is acceptable if the final coordinates are correct.