

Coordinate Move Lab

Track one transformation at a time.

GRADE 8 • MA.8.GR.2.3

MA.8.GR.2.3 "Describe and apply the effect of a single transformation on two-dimensional figures using coordinates and the coordinate plane."

NAME _____

DATE _____

ONE MOVE, EVERY VERTEX

A single transformation changes a figure by one move, such as a translation, reflection, rotation, or dilation. For a translation, add the horizontal and vertical changes to every vertex. For a reflection or rotation about the origin, use the coordinate rule for that move on each vertex.

WORKED EXAMPLE

Triangle A(-16, 14), B(-12, 14), and C(-15, 17) is translated right 11 units and down 13 units. Find the image coordinates.

1. Add 11 to each x-coordinate.
2. Subtract 13 from each y-coordinate.
3. $A'(-16 + 11, 14 - 13) = (-5, 1)$; $B'(-12 + 11, 14 - 13) = (-1, 1)$; $C'(-15 + 11, 17 - 13) = (-4, 4)$.

Answer: A'(-5, 1), B'(-1, 1), C'(-4, 4)

PRACTICE 6 problems

- 1** Triangle J(6, 8), K(9, 8), and L(6, 9) is translated left 3 units and down 2 units. Find J', K', and L'.

ANSWER _____

- 2** Segment UV has endpoints U(9, -2) and V(10, 3). Reflect the segment across the y-axis.

ANSWER _____

- 3** Triangle R(-7, 6), S(-3, 6), and T(-7, 8) is reflected across the x-axis. Find the image coordinates.

ANSWER _____

- 4** Segment MN has endpoints M(8, 3) and N(10, 6). Rotate the segment 90-degree clockwise about the origin.

ANSWER _____

- 5** Triangle G(-3, 9), H(-7, 9), and I(-3, 7) is rotated 180-degree about the origin. Find the image coordinates.

ANSWER _____

- 6** Triangle P(21, 7), Q(-21, 7), and R(21, -7) is dilated from the origin by a scale factor of $\frac{3}{7}$. Find the image coordinates.

ANSWER _____

APPLY IT Show your work

1

A gaming club designs a triangular logo with vertices $A(18, -20)$, $B(20, -20)$, and $C(18, -18)$. To make a mirror image for the other side of a poster, the club reflects the logo across the y -axis. What are the image coordinates?

WORK SPACE

ANSWER _____

2

A dance club maps a triangular stage formation with vertices $D(-19, 20)$, $E(-21, 20)$, and $F(-19, 22)$. The formation rotates 90 -degree counterclockwise about the origin. What are the new coordinates?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Triangle $A(22, 23)$, $B(24, 23)$, and $C(22, 26)$ has image $A'(-22, -23)$, $B'(-24, -23)$, and $C'(-22, -26)$. Name the single transformation and write its coordinate rule.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Triangle J(6, 8), K(9, 8), and L(6, 9) is translated left 3 units and down 2 units. Find J', K', and L'.	J'(3, 6), K'(6, 6), L'(3, 7)
2	Segment UV has endpoints U(9, -2) and V(10, 3). Reflect the segment across the y-axis.	U'(-9, -2), V'(-10, 3)
3	Triangle R(-7, 6), S(-3, 6), and T(-7, 8) is reflected across the x-axis. Find the image coordinates.	R'(-7, -6), S'(-3, -6), T'(-7, -8)
4	Segment MN has endpoints M(8, 3) and N(10, 6). Rotate the segment 90-degree clockwise about the origin.	M'(3, -8), N'(6, -10)
5	Triangle G(-3, 9), H(-7, 9), and I(-3, 7) is rotated 180-degree about the origin. Find the image coordinates.	G'(3, -9), H'(7, -9), I'(3, -7)
6	Triangle P(21, 7), Q(-21, 7), and R(21, -7) is dilated from the origin by a scale factor of $\frac{3}{7}$. Find the image coordinates.	P'(9, 3), Q'(-9, 3), R'(9, -3)

PART 2 • APPLY IT

- A'(-18, -20), B'(-20, -20), C'(-18, -18)** Reflecting across the y-axis changes each x-coordinate to its opposite and keeps each y-coordinate the same.
- D'(-20, -19), E'(-20, -21), F'(-22, -19)** For a 90-degree counterclockwise rotation about the origin, use (x, y) to become (-y, x) for each vertex.

CHALLENGE

A 180-degree rotation about the origin. The rule is (x, y) to (-x, -y).

Accept correctly ordered coordinate pairs with or without spaces. For the challenge, accept "rotation 180 degrees about the origin" and the equivalent rule that both coordinates change signs.