

Flip Shift Map

Track polygon images after reflections and translations.

GRADE 8 • 8.MG.3.c

8.MG.3.c "Given a preimage in the coordinate plane, identify the coordinates of the image of a polygon that has been translated and reflected over the x- or y-axis or reflected over the x- or y-axis and then translated."

NAME _____

DATE _____

TRACK EACH MOVE

A reflection over the x-axis changes (x, y) to $(x, -y)$. A reflection over the y-axis changes (x, y) to $(-x, y)$, then complete any translation in the order given.

WORKED EXAMPLE

Triangle A(8, -6), B(10, -6), and C(9, -4) is reflected over the y-axis, then translated left 3 units and up 7 units. Find the image.

1. Reflect over the y-axis: A'(-8, -6), B'(-10, -6), C'(-9, -4).
2. Move left 3: (-11, -6), (-13, -6), (-12, -4).
3. Move up 7: (-11, 1), (-13, 1), (-12, 3).

Answer: A'(-11, 1), B'(-13, 1), C'(-12, 3)

PRACTICE 5 problems

- 1** Triangle A(14, 15), B(16, 15), and C(14, 17) is translated right 2 units and up 5 units, then reflected over the x-axis. Find the image.

ANSWER _____

- 2** Rectangle K(-15, 14), L(-18, 14), M(-18, 16), and N(-15, 16) is reflected over the y-axis, then translated up 5 units. Find the image.

ANSWER _____

- 3** Triangle P(18, -14), Q(16, -15), and R(18, -17) is reflected over the x-axis, then translated left 2 units. Find the image.

ANSWER _____

- 4** Triangle J(-18, -15), K(-16, -15), and L(-17, -17) is translated right 2 units, then reflected over the y-axis. Find the image.

ANSWER _____

- 5** Square W(14, 18), X(16, 18), Y(16, 16), and Z(14, 16) is reflected over the y-axis, then translated down 2 units. Find the image.

ANSWER _____

APPLY IT Show your work

- 1** On a video game map, a triangular zone has vertices A(-18, 14), B(-16, 14), and C(-17, 16). The zone is reflected over the x-axis, then moved right 2 units and down 2 units. What are the new coordinates?

WORK SPACE

ANSWER _____

- 2** A mural design has vertices D(-14, -15), E(-16, -15), and F(-15, -17). The design is reflected over the y-axis, then moved right 2 units and down 5 units. What are the new coordinates?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Triangle G(-18, 14), H(-16, 14), and I(-17, 16) is reflected over the y-axis, then translated right 2 units. Find the image. Then explain why translating right 2 units first, then reflecting over the y-axis, gives a different image.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Triangle A(14, 15), B(16, 15), and C(14, 17) is translated right 2 units and up 5 units, then reflected over the x-axis. Find the image.	A'(16, -20), B'(18, -20), C'(16, -22)
2	Rectangle K(-15, 14), L(-18, 14), M(-18, 16), and N(-15, 16) is reflected over the y-axis, then translated up 5 units. Find the image.	K'(15, 19), L'(18, 19), M'(18, 21), N'(15, 21)
3	Triangle P(18, -14), Q(16, -15), and R(18, -17) is reflected over the x-axis, then translated left 2 units. Find the image.	P'(16, 14), Q'(14, 15), R'(16, 17)
4	Triangle J(-18, -15), K(-16, -15), and L(-17, -17) is translated right 2 units, then reflected over the y-axis. Find the image.	J'(16, -15), K'(14, -15), L'(15, -17)
5	Square W(14, 18), X(16, 18), Y(16, 16), and Z(14, 16) is reflected over the y-axis, then translated down 2 units. Find the image.	W'(-14, 16), X'(-16, 16), Y'(-16, 14), Z'(-14, 14)

PART 2 • APPLY IT

1. **A'(-16, -16), B'(-14, -16), C'(-15, -18)** Reflect each point over the x-axis, then add 2 to each x-coordinate and subtract 2 from each y-coordinate.
2. **D'(16, -20), E'(18, -20), F'(17, -22)** First change each x-coordinate to its opposite. Then add 2 to each x-coordinate and subtract 5 from each y-coordinate.

CHALLENGE

Reflect, then translate: G'(20, 14), H'(18, 14), I'(19, 16). Translate, then reflect: G'(16, 14), H'(14, 14), I'(15, 16). The y-axis reflection reverses left and right, so the order changes the final x-coordinates.

Accept coordinates in any order if each image point is correctly matched to its original label. Accept a correct explanation that states that reflecting over the y-axis reverses horizontal direction.