

Rational Plane Quest

Use signs, axes, and reflections to locate rational points.

GRADE 6 • MA.6.GR.1.1

MA.6.GR.1.1 "Extend previous understanding of the coordinate plane to plot rational number ordered pairs in all four quadrants and on both axes. Identify the x- or y-axis as the line of reflection when two ordered pairs have an opposite x- or..."

NAME _____

DATE _____

SIGNS AND REFLECTIONS

The signs of an ordered pair tell its location: positive x is right, negative x is left, positive y is up, and negative y is down. If x is 0, the point is on the y-axis. If y is 0, the point is on the x-axis. A reflection across the y-axis changes only the x-coordinate, and a reflection across the x-axis changes only the y-coordinate.

WORKED EXAMPLE

Point R is at $(-5/6, 7/4)$. Reflect R across the y-axis.

1. A y-axis reflection keeps the y-coordinate, $7/4$.
2. Change the sign of the x-coordinate, $-5/6$ becomes $5/6$.
3. Write the reflected ordered pair.

Answer: $(5/6, 7/4)$

PRACTICE 6 problems

- 1** Which quadrant contains the point $(1/2, 3/8)$?

ANSWER _____

- 2** Which quadrant contains the point $(-2/3, 1/9)$?

ANSWER _____

- 3** Which quadrant contains the point $(-1/8, -2/9)$?

ANSWER _____

- 4** Which quadrant contains the point $(3/2, -1/3)$?

ANSWER _____

- 5** Is the point $(3/8, 0)$ on an axis? Name the axis.

ANSWER _____

- 6** Point T is at $(2/3, -1/8)$. Reflect T across the y-axis.

ANSWER _____

APPLY IT Show your work

- 1** In a dance game, a spotlight is at $(-2/9, 3/8)$. The next level mirrors the stage across the x-axis. What are the spotlight's new coordinates? In which quadrant is it?

WORK SPACE

ANSWER _____

- 2** In a soccer video game, a teammate is at $(3/2, 1/8)$. A second teammate is placed as a reflection across the y-axis. What are the second teammate's coordinates? In which quadrant is the second teammate?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Points A and B are reflections across one axis. Point A is $(-1/3, -2/9)$, and point B is $(x, -2/9)$. Find x and name the line of reflection. Explain how the coordinates show your answer.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Which quadrant contains the point $(1/2, 3/8)$?	Quadrant I
2	Which quadrant contains the point $(-2/3, 1/9)$?	Quadrant II
3	Which quadrant contains the point $(-1/8, -2/9)$?	Quadrant III
4	Which quadrant contains the point $(3/2, -1/3)$?	Quadrant IV
5	Is the point $(3/8, 0)$ on an axis? Name the axis.	Yes, the x-axis.
6	Point T is at $(2/3, -1/8)$. Reflect T across the y-axis.	$(-2/3, -1/8)$

PART 2 • APPLY IT

1. **$(-2/9, -3/8)$, Quadrant III** A reflection across the x-axis keeps x the same and changes the sign of y. Both coordinates are negative, so the image is in Quadrant III.
2. **$(-3/2, 1/8)$, Quadrant II** A reflection across the y-axis changes the sign of x and keeps y the same. The x-coordinate is negative and the y-coordinate is positive, so the point is in Quadrant II.

CHALLENGE

$x = 1/3$; the line of reflection is the y-axis. The y-coordinates are the same, and the x-coordinates are opposites.

Accept quadrant names or Roman numerals I, II, III, and IV. Accept equivalent fractions in ordered pairs, such as $-4/6$ for $-2/3$.