

Quadrant Sign Detectives

Use positive and negative signs to locate points.

GRADE 6 • 6.PAR.8.2

6.PAR.8.2 "Show and explain that signs of numbers in ordered pairs indicate locations in quadrants of the coordinate plane and determine how two ordered pairs may differ based only on the signs."

NAME _____

DATE _____

SIGNS SHOW LOCATION

The sign of x tells whether a point is left or right of the y -axis.
The sign of y tells whether a point is above or below the x -axis.
Quadrant I is $(+, +)$, Quadrant II is $(-, +)$, Quadrant III is $(-, -)$,
and Quadrant IV is $(+, -)$.

WORKED EXAMPLE

Which quadrant contains the point $(8, -6)$?

1. The x -coordinate, 8, is positive.
2. The y -coordinate, -6, is negative.
3. A positive x -coordinate and a negative y -coordinate make the sign pattern $(+, -)$.
4. The point is in Quadrant IV.

Answer: Quadrant IV

PRACTICE 6 problems

1 Which quadrant contains point A $(-3, 5)$?

ANSWER _____

2 Which quadrant contains point B $(4, -2)$?

ANSWER _____

3 Which quadrant contains point C $(-1, -7)$?

ANSWER _____

4 Which quadrant contains point D $(9, 3)$?

ANSWER _____

5 Point E is in Quadrant II. What are the signs of its x -coordinate and y -coordinate?

ANSWER _____

6 Point P is $(-5, 2)$ and point Q is $(-5, -2)$. How do the signs of the two ordered pairs differ?

ANSWER _____

APPLY IT Show your work

- 1** In a game-design club, Ava places a treasure at $(-4, 3)$ and a portal at $(2, -5)$ on a game map. Name the quadrant of each location. Then tell whether the signs of x and y are the same or different for the two locations.

WORK SPACE

ANSWER _____

- 2** A skate park map shows the ramp at $(-2, -4)$ and the water station at $(-2, 4)$. Name the quadrant of each location. Then describe the sign change from the ramp to the water station.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Two points are in different quadrants. Their x -coordinates have the same sign, but their y -coordinates have opposite signs. List all possible pairs of quadrants and explain why.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Which quadrant contains point A (-3, 5)?	Quadrant II
2	Which quadrant contains point B (4, -2)?	Quadrant IV
3	Which quadrant contains point C (-1, -7)?	Quadrant III
4	Which quadrant contains point D (9, 3)?	Quadrant I
5	Point E is in Quadrant II. What are the signs of its x-coordinate and y-coordinate?	x is negative and y is positive.
6	Point P is (-5, 2) and point Q is (-5, -2). How do the signs of the two ordered pairs differ?	The x-coordinates have the same negative sign. The y-coordinate changes from positive to negative.

PART 2 • APPLY IT

- 1. The treasure is in Quadrant II, and the portal is in Quadrant IV. The x signs are different, and the y signs are different.** For the treasure, the signs are $(-, +)$, which is Quadrant II. For the portal, the signs are $(+, -)$, which is Quadrant IV, so both coordinate signs change.
- 2. The ramp is in Quadrant III, and the water station is in Quadrant II. The x sign stays negative, and the y sign changes from negative to positive.** The ramp has signs $(-, -)$, so it is in Quadrant III. The water station has signs $(-, +)$, so it is in Quadrant II.

CHALLENGE

The points can be in Quadrants I and IV, or in Quadrants II and III. In each pair, the x signs match and the y signs are opposite.

Accept quadrant names or Roman numerals. For sign descriptions, accept words such as positive and negative or the symbols $+$ and $-$.