

Axis Distance Detectives

Use coordinates to measure distance from axes and along grid lines.

GRADE 6 • 6.MG.3.e

6.MG.3.e "Relate the coordinates of a point to the distance from each axis and relate the coordinates of a single point to another point on the same horizontal or vertical line. Ordered pairs will be limited to coordinates expressed as integers."

NAME _____

DATE _____

COORDINATES SHOW DISTANCE

For a point (x, y) , the distance from the y -axis is the absolute value of x . The distance from the x -axis is the absolute value of y . Points with the same y -coordinate are on a horizontal line, and points with the same x -coordinate are on a vertical line.

WORKED EXAMPLE

Point W is at $(12, -15)$. Find its distance from each axis.

1. The x -coordinate is 12, so W is 12 units from the y -axis.
2. The y -coordinate is -15, so W is 15 units from the x -axis.
3. Use positive distances, even when a coordinate is negative.

Answer: W is 12 units from the y -axis and 15 units from the x -axis.

PRACTICE 6 problems

- 1** Point P is at $(-7, 4)$. How far is P from the y -axis? How far is P from the x -axis?

ANSWER _____

- 2** Point Q is at $(0, -9)$. How far is Q from the y -axis? How far is Q from the x -axis?

ANSWER _____

- 3** Points A $(-3, 8)$ and B $(5, 8)$ are on the same line. Is the line horizontal or vertical? How far apart are the points?

ANSWER _____

- 4** Points M $(6, -2)$ and N $(6, 11)$ are on the same line. Is the line horizontal or vertical? How far apart are the points?

ANSWER _____

- 5** A point is 10 units from the y -axis and 3 units below the x -axis. What are the two possible coordinates?

ANSWER _____

- 6** Points R $(-14, 5)$ and S $(-14, -6)$ are on the same vertical line. How far apart are they?

ANSWER _____

APPLY IT Show your work

- 1** In a video game, a player's base is at $(-16, 7)$ and a supply drop is at $(-16, -5)$. The player travels straight along the grid line from the base to the supply drop. How many units does the player travel?

WORK SPACE

ANSWER _____

- 2** For a school festival map, a photo booth must be 13 units from the y-axis and 4 units above the x-axis. What are the two possible locations for the booth?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Point H is at $(-18, -10)$. Point J is on the same horizontal line as H and is 25 units from H. Point J is to the right of the y-axis. What are the coordinates of J? Explain how you found them.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Point P is at $(-7, 4)$. How far is P from the y-axis? How far is P from the x-axis?	7 units from the y-axis and 4 units from the x-axis.
2	Point Q is at $(0, -9)$. How far is Q from the y-axis? How far is Q from the x-axis?	0 units from the y-axis and 9 units from the x-axis.
3	Points A $(-3, 8)$ and B $(5, 8)$ are on the same line. Is the line horizontal or vertical? How far apart are the points?	The line is horizontal, and the points are 8 units apart.
4	Points M $(6, -2)$ and N $(6, 11)$ are on the same line. Is the line horizontal or vertical? How far apart are the points?	The line is vertical, and the points are 13 units apart.
5	A point is 10 units from the y-axis and 3 units below the x-axis. What are the two possible coordinates?	$(10, -3)$ and $(-10, -3)$
6	Points R $(-14, 5)$ and S $(-14, -6)$ are on the same vertical line. How far apart are they?	11 units

PART 2 • APPLY IT

- 12 units** The points have the same x-coordinate, so they are on a vertical line. Count the change from 7 to -5, which is 12 units.
- $(13, 4)$ and $(-13, 4)$** Being 13 units from the y-axis means the x-coordinate can be 13 or -13. Being 4 units above the x-axis means the y-coordinate is 4.

CHALLENGE

J is at $(7, -10)$. J has the same y-coordinate as H, so its y-coordinate is -10. Moving 25 units right from $x = -18$ gives $x = 7$.

Accept distances written with or without the word "units." For the challenge, accept a correct explanation that identifies the shared y-coordinate and shows that $-18 + 25 = 7$.