

Coordinate Distance Quest

Plot points and measure horizontal or vertical travel.

GRADE 6 • 6.PAR.8.3

6.PAR.8.3 "Solve problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same x-coordinate or the same y-coordinate."

NAME _____

DATE _____

The big idea

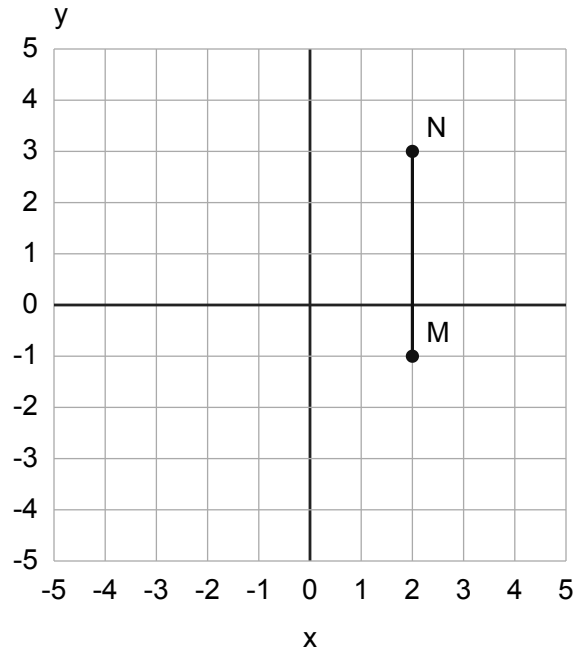
For points with the same y-coordinate, distance = $|x_2 - x_1|$. For points with the same x-coordinate, distance = $|y_2 - y_1|$. Absolute value makes a distance nonnegative. Check whether the route is horizontal, vertical, or made of two legs.

Worked example

Find the vertical distance from M(2, -1) to N(2, 3).

The x-coordinates match. Use $|3 - (-1)| = |4|$.

MN = 4 units.



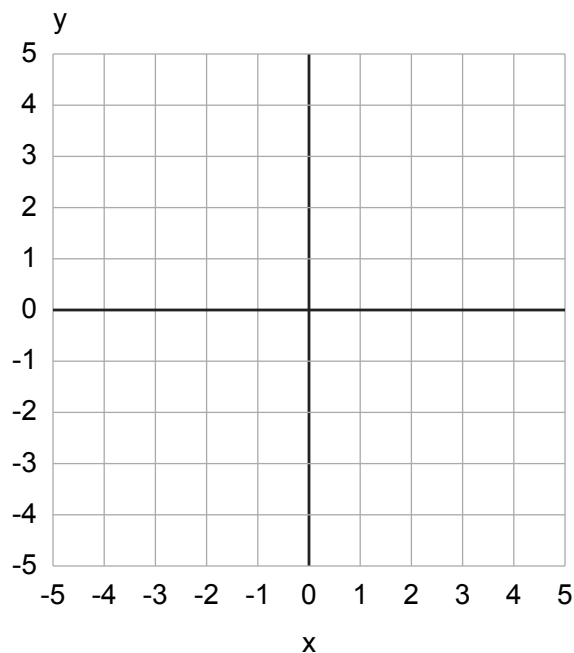
Plot and label all requested points. Use the ruled space for calculations and explanations.

1. Practice

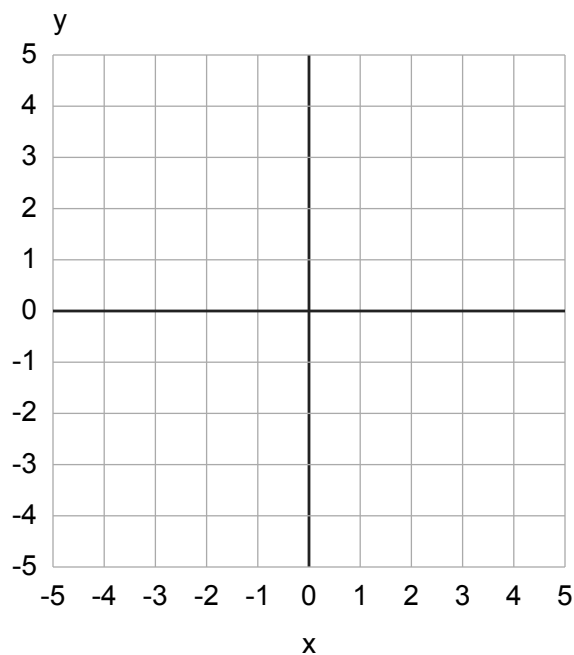
Points G(-4, -2) and H(-1, -2) lie on the same side of the y-axis. Kai adds $4 + 1$ to get their distance. Explain the error and write a correct absolute-value expression.

2. Practice

Plot A(-3, 2) and B(2, 2). Name their quadrants, then use an absolute-value expression to find AB.

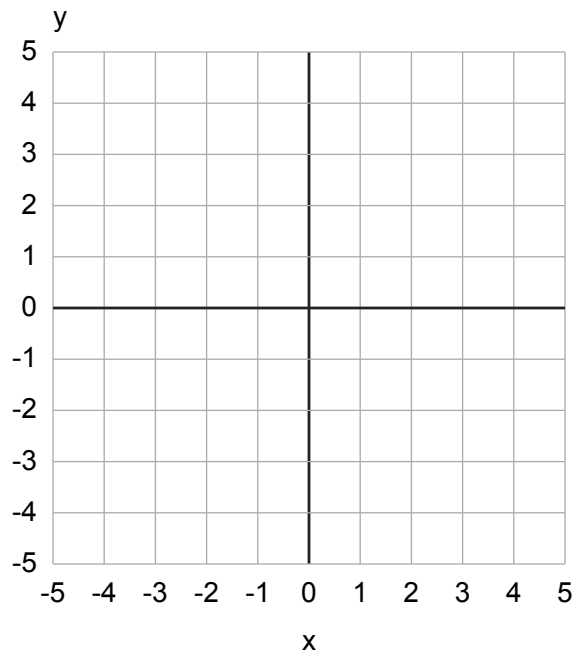
**3. Practice**

Plot C(-2, -3) and D(3, -3). Name their quadrants and find CD using absolute value.

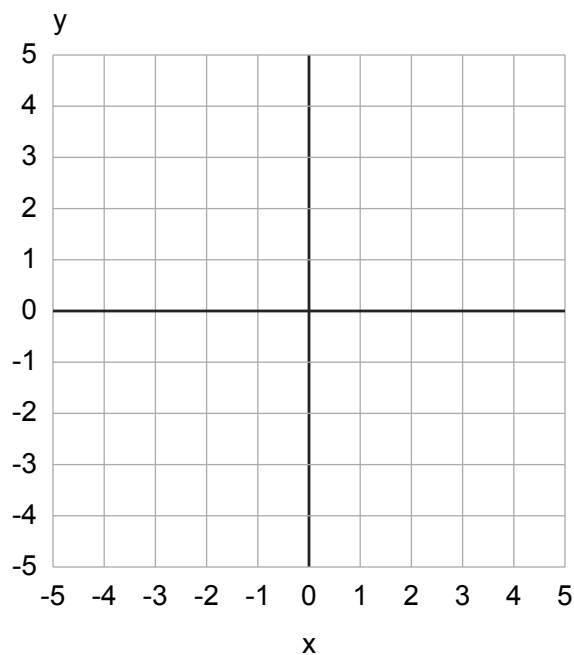


4. Practice

Plot $E(-3, -1)$ and $F(-3, 3)$. Explain which coordinate stays the same. Find EF using absolute value.

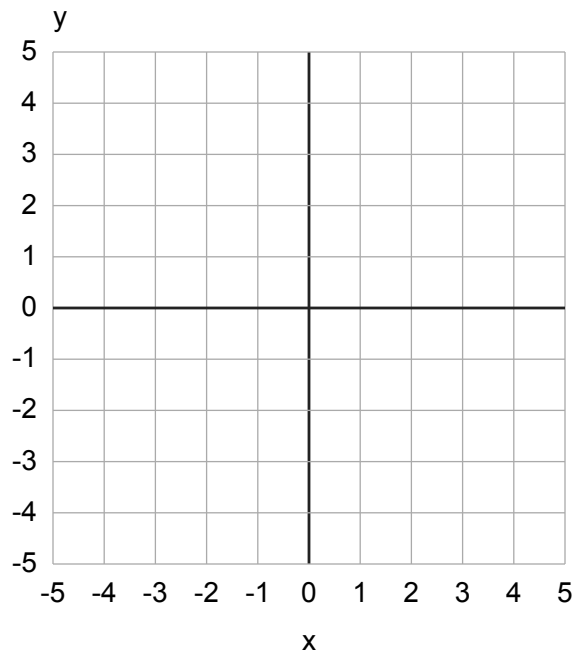
**5. Apply**

A map uses 1 unit = 1 meter. A fountain is $F(3, -2)$ and a bench is $B(3, 4)$. Plot both. How far is the straight vertical walk from the fountain to the bench? Show absolute value.

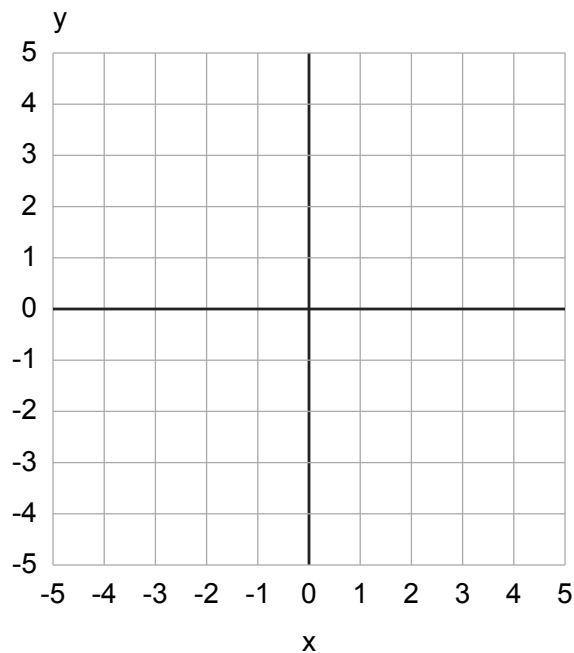


6. Apply

A robot starts at $A(-4, 3)$, travels down to $B(-4, -2)$, then right to $C(2, -2)$. Plot the route A-B-C. Each unit is 1 meter. Find each leg and the total distance using absolute value.

**7. Challenge**

Point P is $(1, -1)$. Find BOTH points on the same horizontal line that are 3 units from P. Plot P and the two possible points. Use absolute value to verify both distances.



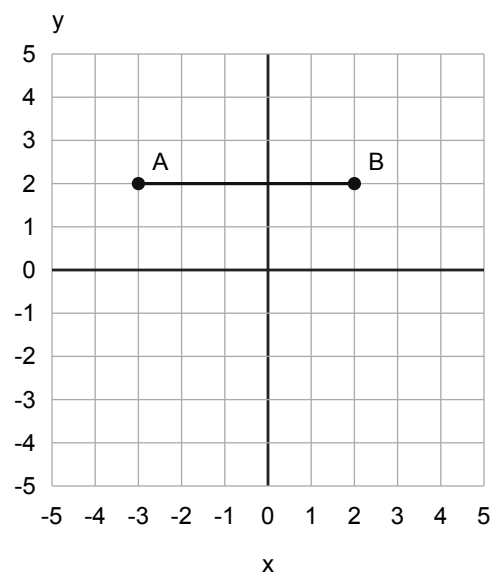
Every small grid interval is 1 unit. Require plotting across all four quadrants in Tasks 2 and 3. Accept subtraction in either order inside absolute value. Task 6 asks for route distance, not a diagonal distance.

Task 1

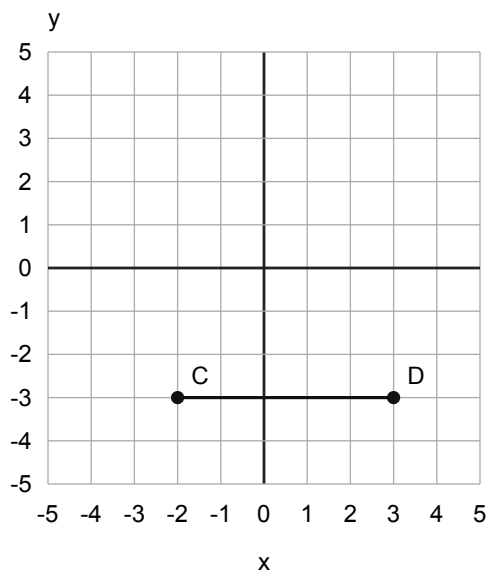
Adding distances from zero double-counts the shared part. $GH = |-1 - (-4)| = 3$ units.

Task 2

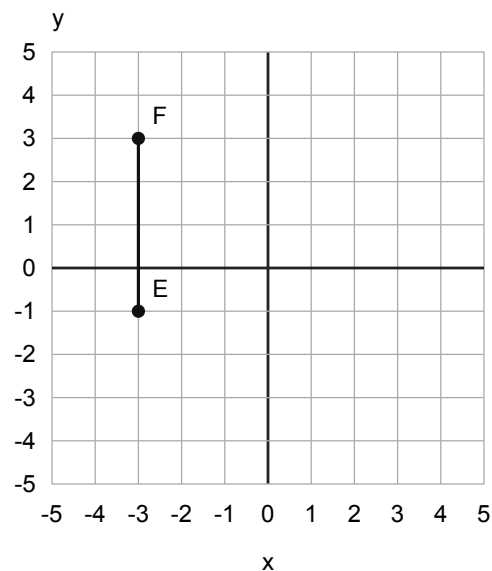
A: II; B: I. $AB = |2 - (-3)| = 5$ units.

**Task 3**

C: III; D: IV. $CD = |3 - (-2)| = 5$ units.

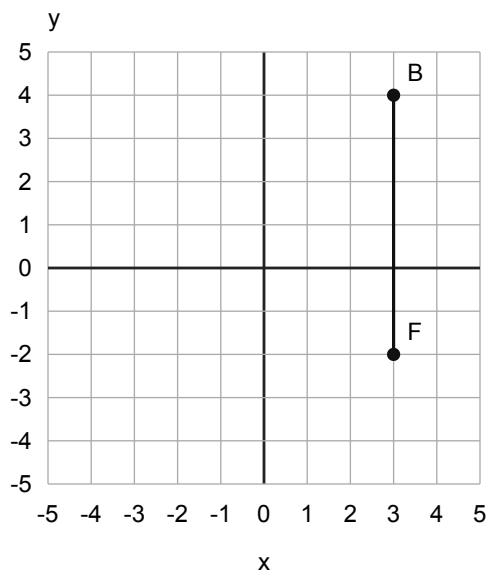
**Task 4**

Both x-values are -3. $EF = |3 - (-1)| = 4$ units.



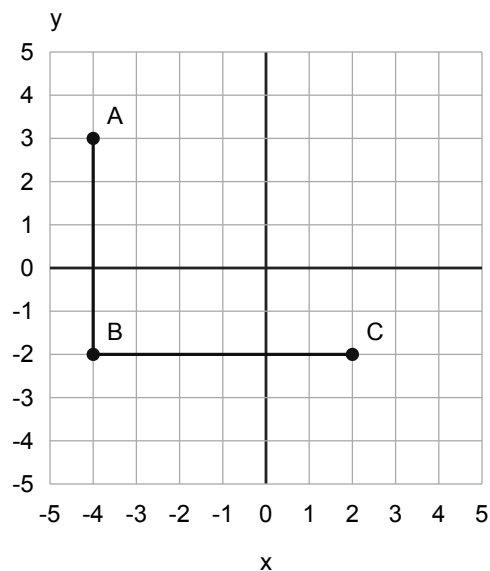
Task 5

$FB = |4 - (-2)| = 6$ meters. The shared x-coordinate means only the y-values change.



Task 6

$AB = |-2 - 3| = 5$ m. $BC = |2 - (-4)| = 6$ m. Total = 11 meters. Add the two straight legs. Do not measure the diagonal from A to C.



Task 7

Possible points are L(-2, -1) and R(4, -1). $|-2 - 1| = 3$ and $|4 - 1| = 3$.

