

Coordinate Quest

Use right triangles to measure map distances.

GRADE 8 • 8.GSR.8.3

8.GSR.8.3 "Apply the Pythagorean Theorem to find the distance between two points in a coordinate system in practical, mathematical problems."

NAME _____

DATE _____

FIND THE DIAGONAL DISTANCE

Make a right triangle by finding the horizontal change and the vertical change between the points. Square both changes, add the results, and take the square root to find the distance.

WORKED EXAMPLE

Find the distance between (1, 2) and (6, 14).

1. Horizontal change: $6 - 1 = 5$

2. Vertical change: $14 - 2 = 12$

3. Distance = $\sqrt{5^2 + 12^2} = \sqrt{25 + 144} = \sqrt{169} = 13$

Answer: 13 units

PRACTICE 6 problems

1 Find the distance between (3, 4) and (11, 19).

ANSWER _____

2 Find the distance between (0, 3) and (10, 27).

ANSWER _____

3 Find the distance between (-11, 7) and (9, 28).

ANSWER _____

4 Find the distance between (-9, 7) and (9, 31).

ANSWER _____

5 Find the distance between (7, -9) and (23, 21).

ANSWER _____

6 Find the distance between (4, -9) and (11, 0). Give your answer in simplest radical form.

ANSWER _____

APPLY IT Show your work

- 1** The robotics club uses a coordinate map measured in meters. A robot starts at $(7, -11)$ and travels directly to a charging station at $(16, 29)$. How far does the robot travel?

WORK SPACE

ANSWER _____

- 2** On a festival map, the main stage is at $(-9, 8)$ and the photo booth is at $(15, 26)$. A student walks directly from the stage to the photo booth. How far does the student walk?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A point is at $(x, 17)$. It is 29 units from $(3, -3)$, and $x > 3$. Find x .

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Find the distance between (3, 4) and (11, 19).	17 units
2	Find the distance between (0, 3) and (10, 27).	26 units
3	Find the distance between (-11, 7) and (9, 28).	29 units
4	Find the distance between (-9, 7) and (9, 31).	30 units
5	Find the distance between (7, -9) and (23, 21).	34 units
6	Find the distance between (4, -9) and (11, 0). Give your answer in simplest radical form.	$\sqrt{130}$ units

PART 2 • APPLY IT

1. **41 meters** The horizontal change is 9 meters and the vertical change is 40 meters. Use $\sqrt{9^2 + 40^2}$ to get 41 meters.
2. **30 grid units** The horizontal change is 24 grid units and the vertical change is 18 grid units. Use $\sqrt{24^2 + 18^2}$ to get 30 grid units.

CHALLENGE

x = 24

Accept equivalent work that uses positive or negative coordinate differences before squaring. For problem 6, accept $\sqrt{130}$, but not a rounded decimal.