

# Coordinate Distance Quest

Use right triangles to measure map distances.

GRADE 8 • 8.G.B.8

**CCSS.Math.Content.8.G.B.8** "Apply the Pythagorean Theorem to find the distance between two points in a coordinate system."

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## DISTANCE ON A GRID

Find the horizontal change and the vertical change between the points. Use  $d = \sqrt{(\text{horizontal change})^2 + (\text{vertical change})^2}$ ; distance is nonnegative, and it is 0 when both points are the same point.

## WORKED EXAMPLE

Find the distance between (1, 2) and (4, 6).

1. Find the changes:  $4 - 1 = 3$  horizontally and  $6 - 2 = 4$  vertically.
2. Use the Pythagorean Theorem:  $d^2 = 3^2 + 4^2 = 9 + 16 = 25$ .
3. Take the square root:  $d = \sqrt{25} = 5$ .

**Answer: 5 units**

## PRACTICE 6 problems

- 1** Find the distance between A(7, 8) and B(7, 15).

**ANSWER** \_\_\_\_\_

- 2** Find the distance between C(-8, 9) and D(-16, 9).

**ANSWER** \_\_\_\_\_

- 3** Find the distance between E(10, 11) and F(18, 26).

**ANSWER** \_\_\_\_\_

- 4** Find the distance between G(-12, 14) and H(-21, 26).

**ANSWER** \_\_\_\_\_

- 5** Find the distance between J(13, -17) and K(20, 7).

**ANSWER** \_\_\_\_\_

- 6** Find the distance between L(-11, 12) and M(17, 33).

**ANSWER** \_\_\_\_\_

## APPLY IT Show your work

- 1** In a video game, Maya's character is at  $(12, -9)$ . The next checkpoint is at  $(27, 11)$ . How far is Maya's character from the checkpoint?

WORK SPACE

ANSWER \_\_\_\_\_

- 2** On a digital campus map, the art club meets at  $(9, -18)$  and the robotics room is at  $(23, 30)$ . How far apart are the two rooms?

WORK SPACE

ANSWER \_\_\_\_\_

## CHALLENGE One step up

### CHALLENGE

The points  $P(-15, 9)$ ,  $Q(21, 9)$ , and  $R(21, 36)$  are the vertices of a triangle. Find the perimeter of triangle PQR.

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## PART 1 • PRACTICE

| # | PROBLEM                                              | ANSWER          |
|---|------------------------------------------------------|-----------------|
| 1 | Find the distance between A(7, 8) and B(7, 15).      | <b>7 units</b>  |
| 2 | Find the distance between C(-8, 9) and D(-16, 9).    | <b>8 units</b>  |
| 3 | Find the distance between E(10, 11) and F(18, 26).   | <b>17 units</b> |
| 4 | Find the distance between G(-12, 14) and H(-21, 26). | <b>15 units</b> |
| 5 | Find the distance between J(13, -17) and K(20, 7).   | <b>25 units</b> |
| 6 | Find the distance between L(-11, 12) and M(17, 33).  | <b>35 units</b> |

## PART 2 • APPLY IT

- 25 units** The horizontal change is 15 units and the vertical change is 20 units.  $\sqrt{15^2 + 20^2} = \sqrt{625} = 25$  units.
- 50 units** The horizontal change is 14 units and the vertical change is 48 units.  $\sqrt{14^2 + 48^2} = \sqrt{2500} = 50$  units.

## CHALLENGE

**108 units**

Accept correct distances with or without the word units. For the challenge, accept 108 if the student correctly finds side lengths 36, 27, and 45.