

# Coordinate Distance Quest

*Use the Pythagorean Theorem to measure straight-line distance.*

**GRADE 8 • MA.8.GR.1.2**

**MA.8.GR.1.2** "Apply the Pythagorean Theorem to solve mathematical and real-world problems involving the distance between two points in a coordinate plane."

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## FIND THE DIAGONAL DISTANCE

Find the horizontal change and the vertical change between the points. Use  $d = \sqrt{(\text{change in } x)^2 + (\text{change in } y)^2}$ , then simplify the square root.

## WORKED EXAMPLE

Find the distance between (20, 30) and (25, 42).

1. Horizontal change:  $25 - 20 = 5$ .
2. Vertical change:  $42 - 30 = 12$ .
3.  $d = \sqrt{5^2 + 12^2} = \sqrt{25 + 144} = \sqrt{169} = 13$ .

**Answer: 13 units**

## PRACTICE 6 problems

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

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

- 2** Find the distance between (6, -8) and (6, 11).

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

- 3** Find the distance between (0, 0) and (8, 15).

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

- 4** Find the distance between (-23, 1) and (-14, 41).

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

- 5** Find the distance between (-3, -2) and (3, 6).

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

- 6** Find the distance between (-6, -3) and (1, 4).  
Write your answer in simplest radical form.

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

## APPLY IT Show your work

- 1** On a robotics competition map, the charging station is at  $(-11, 7)$  and the repair station is at  $(-2, 47)$ . Each grid unit represents 1 meter. How far apart are the stations in a straight line?

WORK SPACE

ANSWER \_\_\_\_\_

- 2** In a video game map, a portal is at  $(-7, -8)$  and a power-up is at  $(4, 52)$ . Each grid unit represents 1 meter. What is the straight-line distance from the portal to the power-up?

WORK SPACE

ANSWER \_\_\_\_\_

## CHALLENGE One step up

### CHALLENGE

The vertices of a triangle are  $(-9, -7)$ ,  $(-1, -7)$ , and  $(-1, 8)$ . Is the triangle a right triangle? Explain your reasoning, then find its perimeter.

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## PART 1 • PRACTICE

| # | PROBLEM                                                                                    | ANSWER              |
|---|--------------------------------------------------------------------------------------------|---------------------|
| 1 | Find the distance between (-9, 4) and (7, 4).                                              | <b>16 units</b>     |
| 2 | Find the distance between (6, -8) and (6, 11).                                             | <b>19 units</b>     |
| 3 | Find the distance between (0, 0) and (8, 15).                                              | <b>17 units</b>     |
| 4 | Find the distance between (-23, 1) and (-14, 41).                                          | <b>41 units</b>     |
| 5 | Find the distance between (-3, -2) and (3, 6).                                             | <b>10 units</b>     |
| 6 | Find the distance between (-6, -3) and (1, 4). Write your answer in simplest radical form. | <b>7sqrt2 units</b> |

## PART 2 • APPLY IT

1. **41 meters** The horizontal and vertical changes are 9 and 40.  $\sqrt{9^2 + 40^2} = \sqrt{1681} = 41$ .
2. **61 meters** The horizontal and vertical changes are 11 and 60.  $\sqrt{11^2 + 60^2} = \sqrt{3721} = 61$ .

## CHALLENGE

**It is a right triangle. The legs are 8 and 15 units, and the third side is 17 units, so  $8^2 + 15^2 = 17^2$ . Its perimeter is 40 units.**

Accept equivalent correct work that finds the horizontal and vertical changes in either order. For radical answers, accept only simplified radical form.