LESSON MAKER PRO

Coordinate Distance Quest

Use right triangles to measure distance on a coordinate plane.

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."

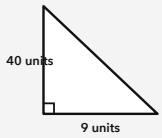
NAME _____ DATE _____

DISTANCE BY RIGHT TRIANGLES

Find the horizontal change by subtracting the x-coordinates and the vertical change by subtracting the y-coordinates. These changes are the legs of a right triangle, so distance = sqrt((horizontal change)^2 + (vertical change)^2).

WORKED EXAMPLE

The right triangle shows the horizontal and vertical changes between two points on a coordinate plane. Find the distance between the points.



1. Horizontal change = 9 and vertical change = 40.
2. $d^2 = 9^2 + 40^2 = 81 + 1600$.
3. d = sqrt(1681) = 41.

Answer: 41 units

PRACTICE 4 problems

1 Find the distance from M(-4, 3) to N(2, 11).

ANSWER _____

2 Find the distance from E(7, -2) to F(15, 4).

ANSWER _____

3 Find the distance from G(-8, -1) to H(-1, 23).

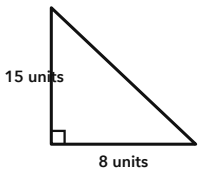
ANSWER _____

4 Find the distance from U(3, -4) to V(18, 16).

ANSWER _____

APPLY IT Show your work

1 On a video game coordinate map, a player is at (-6, 4) and a power-up is at (2, 19). The triangle shows the changes. How far apart are they?



ANSWER _____

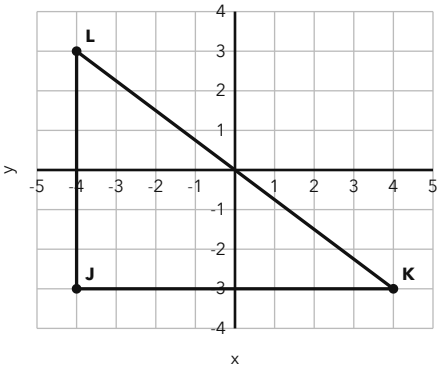
2 A coding club robot moves from (-8, -7) to (12, 14) on its coordinate map. What straight-line distance does it travel?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Triangle JKL is shown. Find its perimeter. Explain why it is a right triangle.



WORK SPACE AND ANSWER

ANSWER KEY

Coordinate Distance Quest

GRADE 8 · MA.8.GR.1.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the distance from M(-4, 3) to N(2, 11).	**10 units**
2	Find the distance from E(7, -2) to F(15, 4).	**10 units**
3	Find the distance from G(-8, -1) to H(-1, 23).	**25 units**
4	Find the distance from U(3, -4) to V(18, 16).	**25 units**

PART 2 · APPLY IT

1. **17 units** The horizontal and vertical changes are 8 and 15. sqrt(8^2 + 15^2) = sqrt(289) = 17.
2. **29 units** The changes are 20 units horizontally and 21 units vertically. sqrt(20^2 + 21^2) = sqrt(841) = 29.

CHALLENGE

24 units; JK = 8, JL = 6, and KL = 10. Since $6^2 + 8^2 = 10^2$, the triangle is right.

Accept correct work using positive or negative coordinate differences before squaring. For the challenge, accept any correct explanation using perpendicular horizontal and vertical sides or the Pythagorean Theorem.