LESSON MAKER PRO

Coordinate Distance Quest

Use the Pythagorean Theorem to measure straight-line distance.

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."

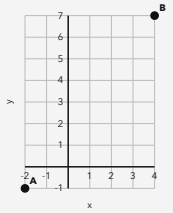
NAME _____ DATE _____

FIND THE TWO CHANGES

To find straight-line distance, subtract the x-coordinates to find the horizontal change and subtract the y-coordinates to find the vertical change. Use d = sqrt((change in x)^2 + (change in y)^2). A negative change is okay because its square is positive.

WORKED EXAMPLE

Points A(-2, -1) and B(4, 7) are shown on the coordinate plane. Find the distance from A to B.



1. Horizontal change: 4 - (-2) = 6. Vertical change: 7 - (-1) = 8.
2. d = sqrt(6^2 + 8^2)
3. d = sqrt(36 + 64) = sqrt(100) = 10

Answer: 10 units

PRACTICE 6 problems

1 Find the distance between (-5, 0) and (0, 12).

ANSWER _____

2 Find the distance between (-3, 1) and (2, 1).

ANSWER _____

3 Find the distance between (3, -5) and (3, 0).

ANSWER _____

4 Find the distance between (-6, -3) and (3, 9).

ANSWER _____

5 Find the exact distance between (0, 2) and (5, 11).

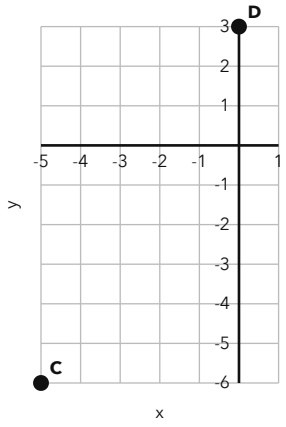
ANSWER _____

6 Find the exact distance between (0, -5) and (3, 0).

ANSWER _____

APPLY IT Show your work

1 On a video game map, you move straight from checkpoint C to checkpoint D. Each grid unit represents 1 meter. How far do you move?



ANSWER _____

2 In a digital art app, a character moves in a straight line from (11, 9) to (16, 14). What is the exact distance of the move?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Point X is at (11, 3), and point Y is at (16, y). The distance from X to Y is 13 units. Find all possible values of y. Explain how you know there are two possible values.

WORK SPACE AND ANSWER

ANSWER KEY

Coordinate Distance Quest

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the distance between (-5, 0) and (0, 12).	**13 units**
2	Find the distance between (-3, 1) and (2, 1).	**5 units**
3	Find the distance between (3, -5) and (3, 0).	**5 units**
4	Find the distance between (-6, -3) and (3, 9).	**15 units**
5	Find the exact distance between (0, 2) and (5, 11).	**sqrt(106) units**
6	Find the exact distance between (0, -5) and (3, 0).	**sqrt(34) units**

PART 2 · APPLY IT

1. **sqrt(106) meters** The horizontal change is 5 meters and the vertical change is 9 meters. The distance is sqrt(5^2 + 9^2) = sqrt(106) meters.
2. **5sqrt(2) units** The horizontal and vertical changes are both 5 units. The distance is sqrt(5^2 + 5^2) = sqrt(50) = 5sqrt(2) units.

CHALLENGE

y = 15 or y = -9. The horizontal change is 5, so the vertical change must have a length of 12 because $5^2 + 12^2 = 13^2$. Point Y can be 12 units above or 12 units below y = 3.

Accept equivalent exact radical forms, such as sqrt(50) for 5sqrt(2). Students may use absolute values for horizontal or vertical changes before squaring.