LESSON MAKER PRO

Straight Shot

Find missing lengths and distances on a grid.

GRADE 8 · PA.GM.1

PA.GM.1 "Apply the Pythagorean theorem to solve problems involving triangles. Justify the Pythagorean theorem using measurements, diagrams, or dynamic software to solve problems in two dimensions involving right triangles..."

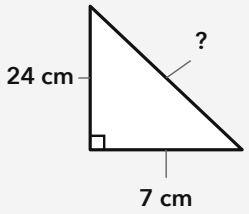
NAME _____ DATE _____

THE RIGHT-TRIANGLE RULE

In a right triangle, the squares of the legs add to the square of the hypotenuse: $a^2 + b^2 = c^2$. On a coordinate grid, horizontal and vertical changes form the legs of a right triangle.

WORKED EXAMPLE

Find the missing side in the figure.



1. The missing side is the hypotenuse.
2. $c^2 = 7^2 + 24^2$
3. $c^2 = 49 + 576 = 625$
4. $c = 25$ because $25^2 = 625$

Answer: 25 cm

PRACTICE 4 problems

1 A right triangle has legs of 3 cm and 4 cm. Find its hypotenuse.

ANSWER _____

2 A right triangle has a hypotenuse of 17 m and a leg of 8 m. Find the other leg.

ANSWER _____

3 Find the distance from (1, 1) to (4, 5).

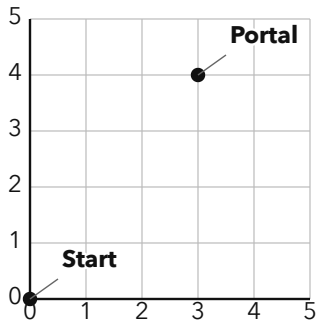
ANSWER _____

4 Find the distance from (-2, 1) to (4, 9).

ANSWER _____

APPLY IT Show your work

1 On a game map, each grid unit is one step. What is the straight-line distance from Start to Portal?



ANSWER _____

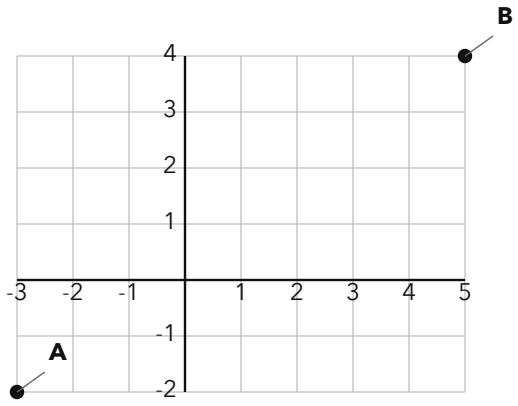
2 A skate park ramp rises 5 ft over 12 ft of level ground. How long is the ramp's straight surface?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Find AB on the grid. Explain why your method uses a right triangle.



WORK SPACE AND ANSWER

ANSWER KEY

Straight Shot

GRADE 8 · PA.GM.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A right triangle has legs of 3 cm and 4 cm. Find its hypotenuse.	**5 cm**
2	A right triangle has a hypotenuse of 17 m and a leg of 8 m. Find the other leg.	**15 m**
3	Find the distance from (1, 1) to (4, 5).	**5 units**
4	Find the distance from (-2, 1) to (4, 9).	**10 units**

PART 2 · APPLY IT

1. **5 steps** The horizontal and vertical changes are 3 and 4 steps. The distance is 5 steps because $3^2 + 4^2 = 5^2$.
2. **13 ft** The ramp is the hypotenuse. Its length is 13 ft because $5^2 + 12^2 = 13^2$.

CHALLENGE

10 units. The horizontal and vertical changes are 8 and 6 units. They meet at a right angle, and $8^2 + 6^2 = 10^2$.

For coordinate problems, accept a correct distance calculation using horizontal and vertical changes. For the challenge, the explanation must identify that those changes are perpendicular.