LESSON MAKER PRO

Find the Shortcut

Use right triangles to find distances.

HIGH SCHOOL · G.RT.1.1

G.RT.1.1 "Apply the distance formula, the Pythagorean theorem, and the Pythagorean theorem converse (approximate and exact values, including Pythagorean triples) to solve problems, using algebraic and logical reasoning and mathematical models."

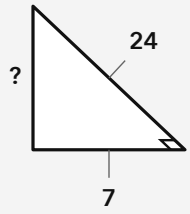
NAME _____ DATE _____

DISTANCE AND RIGHT TRIANGLES

In a right triangle, the squares of the two legs add to the square of the longest side. On a coordinate plane, horizontal and vertical changes can be the legs. If the squares of a triangle's two shorter sides add to the square of its longest side, the triangle is right.

WORKED EXAMPLE

Find the missing side in the figure.



1. $7^2 + 24^2 = c^2$
2. $49 + 576 = c^2$
3. $c = \sqrt{625} = 25$

Answer: 25

PRACTICE 4 problems

1 Find the distance between (1, 1) and (4, 5).

ANSWER _____

2 Find the distance between (-2, 3) and (4, 3).

ANSWER _____

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

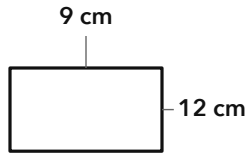
ANSWER _____

4 Do side lengths 6, 8, and 11 make a right triangle? Show one equation.

ANSWER _____

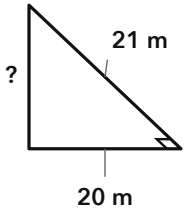
APPLY IT Show your work

1 A video screen has the dimensions shown. How long is its diagonal?



ANSWER _____

2 Two skate park paths meet at a right angle. How long is the straight shortcut marked ?



ANSWER _____

CHALLENGE One step up

A right triangle has side lengths x, x + 1, and x + 2. Find x.

WORK SPACE AND ANSWER

ANSWER KEY

Find the Shortcut

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the distance between (1, 1) and (4, 5).	**5**
2	Find the distance between (-2, 3) and (4, 3).	**6**
3	Find the exact distance between (0, 0) and (3, 3).	**$3\sqrt{2}$**
4	Do side lengths 6, 8, and 11 make a right triangle? Show one equation.	**No. $6^2 + 8^2 = 100$, but $11^2 = 121$.**

PART 2 · APPLY IT

1. **15 cm** The diagonal forms a right triangle with the screen's sides. Its length is $\sqrt{(9^2 + 12^2)} = 15$ cm.
2. **29 m** The shortcut is the longest side. Its length is $\sqrt{(20^2 + 21^2)} = 29$ m.

CHALLENGE

$x = 3$. Solving $x^2 + (x + 1)^2 = (x + 2)^2$ gives $x = 3$ or $x = -1$; only 3 gives valid side lengths.

Accept $\sqrt{18}$ for $3\sqrt{2}$. The challenge requires a positive value of x.