LESSON MAKER PRO

Right Triangle Routes

Use the Pythagorean Theorem in 2-D and 3-D.

GRADE 8 · 8.GSR.8.2

8.GSR.8.2 "Apply the Pythagorean Theorem to determine unknown side lengths in right triangles within authentic, mathematical problems in two and three dimensions."

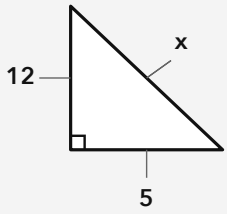
NAME _____ DATE _____

THE BIG IDEA

For a right triangle, add the squares of the two legs to find the square of the hypotenuse: $a^2 + b^2 = c^2$. The hypotenuse is the side across from the right angle.

WORKED EXAMPLE

Find x in the right triangle shown.



1. $5^2 + 12^2 = x^2$
2. $25 + 144 = x^2$
3. $169 = x^2$
4. $x = 13$

Answer: x = 13

PRACTICE 4 problems

1 A right triangle has legs 8 cm and 15 cm. Find x, the hypotenuse.

ANSWER _____

2 A right triangle has hypotenuse 25 m and one leg 7 m. Find x, the other leg.

ANSWER _____

3 A right triangle has legs 9 in. and 40 in. Find x, the hypotenuse.

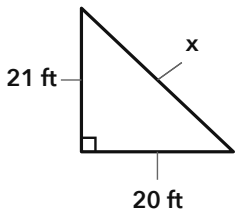
ANSWER _____

4 A right triangle has hypotenuse 17 yd and one leg 15 yd. Find x, the other leg.

ANSWER _____

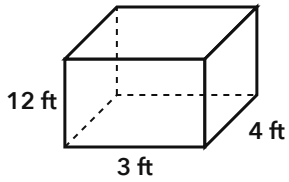
APPLY IT Show your work

1 The skate ramp shown has a right-triangle side view. Find its sloped length.



ANSWER _____

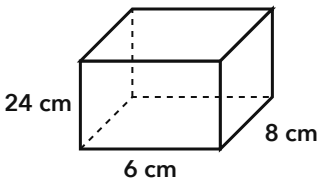
2 An equipment case is shaped like the rectangular prism shown. Find the longest interior diagonal.



ANSWER _____

CHALLENGE One step up

The rectangular game-server case shown has a 6 cm by 8 cm base and a height of 24 cm. Find its longest interior diagonal and show how you used two right triangles.



WORK SPACE AND ANSWER

ANSWER KEY

Right Triangle Routes

GRADE 8 · 8.GSR.8.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A right triangle has legs 8 cm and 15 cm. Find x, the hypotenuse.	**x = 17 cm**
2	A right triangle has hypotenuse 25 m and one leg 7 m. Find x, the other leg.	**x = 24 m**
3	A right triangle has legs 9 in. and 40 in. Find x, the hypotenuse.	**x = 41 in.**
4	A right triangle has hypotenuse 17 yd and one leg 15 yd. Find x, the other leg.	**x = 8 yd**

PART 2 · APPLY IT

1. **x = 29 ft** Use $20^2 + 21^2 = x^2$. Then $x^2 = 841$, so x = 29.
2. **13 ft** First find the base diagonal: $3^2 + 4^2 = 25$. Then use $5^2 + 12^2 = 169$, so the interior diagonal is 13 ft.

CHALLENGE

26 cm. The base diagonal is 10 cm because $6^2 + 8^2 = 10^2$. Then $10^2 + 24^2 = 26^2$.

Accept correct Pythagorean-Theorem work and equivalent equations. Require units on measurement answers.