LESSON MAKER PRO

Find the Missing Side

Use right triangles to solve geometry and real-world problems.

GRADE 8 · 8.G.7

8.G.7 "Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems."

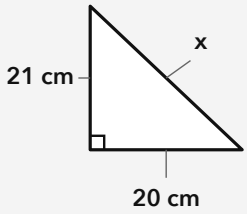
NAME _____ DATE _____

THE BIG IDEA

In a right triangle, the legs meet at the right angle, and the hypotenuse is the longest side. If the legs are a and b and the hypotenuse is c, then $a^2 + b^2 = c^2$. To find a missing leg, subtract the known leg's square from the hypotenuse's square.

WORKED EXAMPLE

Find x in the triangle.

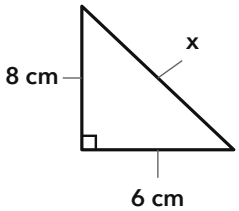


1. $20^2 + 21^2 = x^2$
2. $400 + 441 = x^2$
3. $841 = x^2$, so $x = 29$

Answer: 29 cm

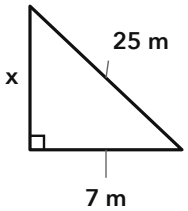
PRACTICE 6 problems

1 Find x in the triangle.



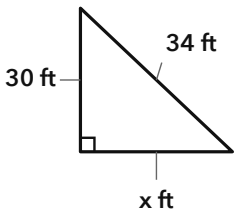
ANSWER _____

2 Find x in the triangle.



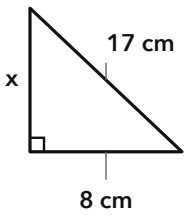
ANSWER _____

3 Find x in the triangle.



ANSWER _____

4 Find x in the triangle.



ANSWER _____

5 A right triangle has legs of 10 inches and 24 inches. Find its hypotenuse.

ANSWER _____

6 A right triangle has a hypotenuse of 13 yards and one leg of 5 yards. Find the other leg.

ANSWER _____

APPLY IT Show your work

1 A skate park ramp rises 3 feet over a horizontal distance of 4 feet. How long is the ramp's sloped surface?

WORK SPACE

ANSWER _____

2 A rectangular gaming tablet screen is 12 inches wide and measures 15 inches diagonally. How tall is the screen?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A right triangle has legs of 6 cm and 8 cm. Its hypotenuse becomes one leg of a second right triangle. The second triangle's other leg is 24 cm. Find the second triangle's hypotenuse. Show both calculations.

WORK SPACE AND ANSWER

ANSWER KEY

Find the Missing Side

GRADE 8 · 8.G.7

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find x in the triangle.	**10 cm**
2	Find x in the triangle.	**24 m**
3	Find x in the triangle.	**16 ft**
4	Find x in the triangle.	**15 cm**
5	A right triangle has legs of 10 inches and 24 inches. Find its hypotenuse.	**26 inches**
6	A right triangle has a hypotenuse of 13 yards and one leg of 5 yards. Find the other leg.	**12 yards**

PART 2 · APPLY IT

1. **5 feet** The rise and horizontal distance are the legs. The sloped surface is $\sqrt{(3^2 + 4^2)} = 5$ feet.
2. **9 inches** The diagonal is the hypotenuse. The height is $\sqrt{(15^2 - 12^2)} = 9$ inches.

CHALLENGE

First triangle: $6^2 + 8^2 = 100$, so its hypotenuse is 10 cm. Second triangle: $10^2 + 24^2 = 676$, so its hypotenuse is 26 cm.

Accept equivalent calculations with the correct units. In the challenge, students must use the first hypotenuse as a leg of the second triangle.