LESSON MAKER PRO

Right Triangle Routes

Use side lengths to find missing distances.

GRADE 8 · MA.8.GR.1.1

MA.8.GR.1.1 "Apply the Pythagorean Theorem to solve mathematical and real-world problems involving unknown side lengths in right triangles."

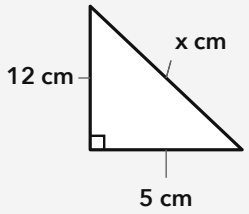
NAME _____ DATE _____

THE PYTHAGOREAN THEOREM

In a right triangle, the two legs and the hypotenuse follow $a^2 + b^2 = c^2$. The hypotenuse is the side across from the right angle, and it is always the longest side.

WORKED EXAMPLE

Find x, the length labeled on the right triangle.

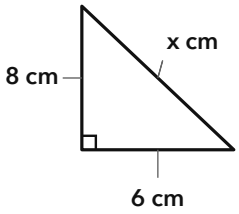


1. $5^2 + 12^2 = x^2$
2. $25 + 144 = x^2$
3. $169 = x^2$
4. $x = 13$

Answer: x = 13 cm

PRACTICE 6 problems

1 Find x, the length labeled on the right triangle.



ANSWER _____

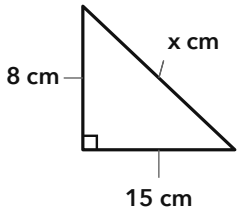
2 A right triangle has a hypotenuse of 25 cm and one leg of 7 cm. Find x, the other leg.

ANSWER _____

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

ANSWER _____

4 Find x, the length labeled on the right triangle.



ANSWER _____

5 A right triangle has legs measuring 20 in. and 21 in. Find x, the hypotenuse.

ANSWER _____

6 A right triangle has a hypotenuse of 34 yd and one leg of 16 yd. Find x, the other leg.

ANSWER _____

APPLY IT Show your work

1 A student is making a custom background for a rectangular tablet screen. The screen is 8 inches wide and 15 inches tall. What is the length x of the screen's diagonal?

WORK SPACE

ANSWER _____

2 At a skate park, a ramp rises 9 feet over a horizontal distance of 40 feet. What is the length x of the sloped ramp?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A right triangle has a hypotenuse of 53 units and one leg of 28 units. Find x, the other leg. Then find the area of the triangle.

WORK SPACE AND ANSWER

ANSWER KEY

Right Triangle Routes

GRADE 8 · MA.8.GR.1.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find x, the length labeled on the right triangle.	**x = 10 cm**
2	A right triangle has a hypotenuse of 25 cm and one leg of 7 cm. Find x, the other leg.	**x = 24 cm**
3	A right triangle has legs measuring 9 m and 40 m. Find x, the hypotenuse.	**x = 41 m**
4	Find x, the length labeled on the right triangle.	**x = 17 cm**
5	A right triangle has legs measuring 20 in. and 21 in. Find x, the hypotenuse.	**x = 29 in.**
6	A right triangle has a hypotenuse of 34 yd and one leg of 16 yd. Find x, the other leg.	**x = 30 yd**

PART 2 · APPLY IT

1. **x = 17 inches** The width and height are the legs of a right triangle. Use $8^2 + 15^2 = x^2$.
2. **x = 41 feet** The rise and horizontal distance are the legs of a right triangle. Use $9^2 + 40^2 = x^2$.

CHALLENGE

x = 45 units; area = 630 square units

Accept equivalent correct equations and positive length values with or without units when the numerical answer is correct. For the challenge, accept 45 units and 630 square units.