LESSON MAKER PRO

Find the Missing Side

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

GRADE 8 · 8A.GM.A.50

8A.GM.A.50 "Apply the Pythagorean Theorem to determine unknown side lengths of right triangles, including real-world applications."

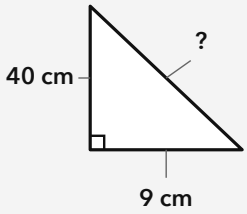
NAME _____ DATE _____

THE RIGHT TRIANGLE RULE

A right triangle has two legs and a hypotenuse, the side across from the right angle. 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.

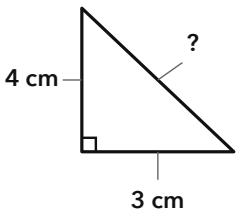


1. The unknown side is across from the right angle, so it is the hypotenuse.
2. $9^2 + 40^2 = x^2$
3. $81 + 1600 = x^2$
4. $1681 = x^2$, so x = 41

Answer: 41 cm

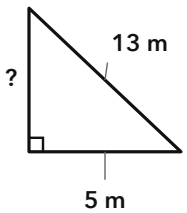
PRACTICE 6 problems

1 Find x in the triangle.



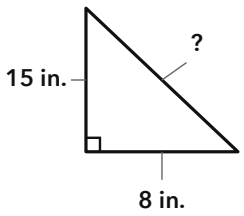
ANSWER _____

2 Find x in the triangle.



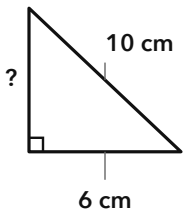
ANSWER _____

3 Find x in the triangle.



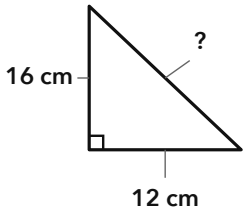
ANSWER _____

4 Find x in the triangle.



ANSWER _____

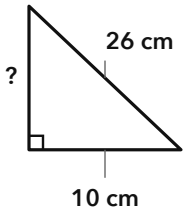
5 Find x. Write the equation you use.



ANSWER _____

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6 Find x. Is the missing side a leg or the hypotenuse?

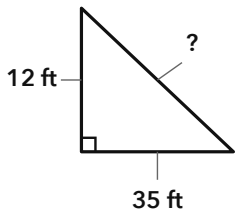


ANSWER _____

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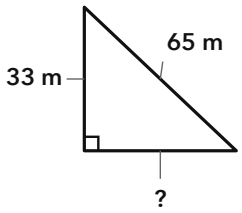
APPLY IT Show your work

1 A skate park ramp has the rise and horizontal run shown. How long is its sloped surface?



ANSWER _____

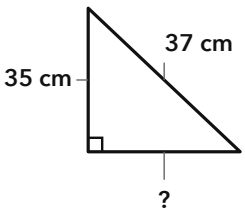
2 A zip line runs from a platform to the ground. Its length and the platform's height are shown. How far is the landing point from the base of the platform?



ANSWER _____

CHALLENGE One step up

Find x. Explain in one sentence why you subtract the squares.



WORK SPACE AND ANSWER

ANSWER KEY

Find the Missing Side

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find x in the triangle.	**5 cm**
2	Find x in the triangle.	**12 m**
3	Find x in the triangle.	**17 in.**
4	Find x in the triangle.	**8 cm**
5	Find x. Write the equation you use.	**$12^2 + 16^2 = x^2$; x = 20 cm**
6	Find x. Is the missing side a leg or the hypotenuse?	**24 cm; leg**

PART 2 · APPLY IT

1. **37 ft** The sloped surface is the hypotenuse. Its length is the square root of $35^2 + 12^2$, or 37 ft.
2. **56 m** The horizontal distance is a leg. Its length is the square root of $65^2 - 33^2$, or 56 m.

CHALLENGE

x = 12 cm because 37 cm is the hypotenuse, so $x^2 = 37^2 - 35^2 = 144$.

Accept equivalent equations that correctly identify the hypotenuse. Answers must include the given units.