

Right Triangle Quest

Use side lengths to solve right-triangle puzzles.

GRADE 8 • 8.G.B

CCSS.Math.Content.8.G.B "Understand and apply the Pythagorean Theorem."

NAME _____

DATE _____

THE PYTHAGOREAN RULE

In a right triangle, the two shorter sides are legs, and the longest side is the hypotenuse. If the legs are a and b and the hypotenuse is c , use $a^2 + b^2 = c^2$, then take a square root when needed.

WORKED EXAMPLE

A right triangle has legs of 20 units and 21 units. Find the hypotenuse c .

- $20^2 + 21^2 = c^2$
- $400 + 441 = c^2$
- $841 = c^2$, so $c = 29$

Answer: $c = 29$ units

PRACTICE 6 problems

- 1** A right triangle has legs of 6 cm and 8 cm. Find the hypotenuse.

ANSWER _____

- 2** A right triangle has legs of 9 m and 12 m. Find the hypotenuse.

ANSWER _____

- 3** A right triangle has a hypotenuse of 25 in. One leg is 7 in. Find the other leg.

ANSWER _____

- 4** A right triangle has a hypotenuse of 26 ft. One leg is 10 ft. Find the other leg.

ANSWER _____

- 5** A triangle has side lengths 12 units, 16 units, and 20 units. Is it a right triangle?

ANSWER _____

- 6** Points $M(2, 3)$ and $N(8, 11)$ are on a coordinate plane. Find the distance from M to N .

ANSWER _____

APPLY IT Show your work

- 1** A skateboard ramp rises 5 feet from the ground. The bottom of the ramp is 12 feet from the wall it leans against. How long is the ramp?

WORK SPACE

ANSWER _____

- 2** A rectangular video wall is 18 feet wide and 24 feet tall. A cable runs straight from one corner to the opposite corner. How long is the cable?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A rectangular esports poster has a diagonal of 37 inches and a height of 12 inches. Find its width. Then find how many inches of LED lights are needed to go around the outside edge of the poster.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A right triangle has legs of 6 cm and 8 cm. Find the hypotenuse.	10 cm
2	A right triangle has legs of 9 m and 12 m. Find the hypotenuse.	15 m
3	A right triangle has a hypotenuse of 25 in. One leg is 7 in. Find the other leg.	24 in
4	A right triangle has a hypotenuse of 26 ft. One leg is 10 ft. Find the other leg.	24 ft
5	A triangle has side lengths 12 units, 16 units, and 20 units. Is it a right triangle?	Yes, it is a right triangle.
6	Points M(2, 3) and N(8, 11) are on a coordinate plane. Find the distance from M to N.	10 units

PART 2 • APPLY IT

- 13 feet** The rise and ground distance are the legs of a right triangle. $5^2 + 12^2 = 13^2$, so the ramp is 13 feet long.
- 30 feet** The width and height are the legs of a right triangle. $18^2 + 24^2 = 30^2$, so the cable is 30 feet long.

CHALLENGE

Width = 35 inches; LED lights needed = 94 inches

Accept equivalent work that correctly uses the Pythagorean Theorem and gives positive side lengths. For the coordinate problem, accept a correct distance calculation using horizontal change 6 and vertical change 8.