

The Pythagorean Theorem: math practice, Grade 8 – download the PDF

21 problems graded by difficulty (★ easy, ★★ medium, ★★★ hard). Try first, without looking at the solutions!

1 Hypotenuse of a 6-8 triangle

★ ★ ★

A right triangle has legs 6 cm and 8 cm. Find the length of the hypotenuse.

2 A longer triple

★ ★ ★

The legs of a right triangle measure 7 in and 24 in. How long is the hypotenuse?

3 Find a missing leg

★ ★ ★

A right triangle has hypotenuse 26 m and one leg 10 m. Find the other leg.

4 True or false?

★ ★ ★

Mia says: "A right triangle with legs 4 cm and 5 cm has a hypotenuse of 9 cm." Is she right? Justify.

5 Complete the table



Find the hypotenuse of each right triangle given its legs.

a. $a = 8, b = 15$

b. $a = 9, b = 40$

c. $a = 12, b = 35$

6 A hypotenuse that is not a whole number



The legs of a right triangle are 3 ft and 5 ft. Give the exact hypotenuse, then round it to the nearest hundredth.

7 Right triangle or not?



Decide whether each triangle is a right triangle.

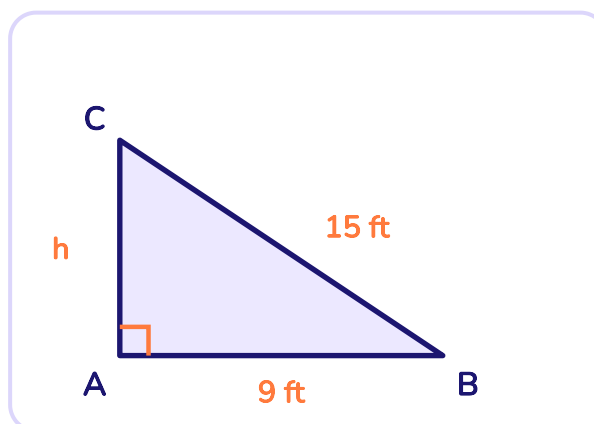
a. Sides 9 in, 12 in, 15 in

b. Sides 7 in, 8 in, 10 in

8 The leaning ladder



A 15 ft ladder leans against a vertical wall. Its foot is 9 ft from the base of the wall. How high up the wall does the ladder reach?



9

A shortcut across a field

A rectangular practice field measures 24 m by 32 m. Jordan runs along the diagonal instead of along two sides. How many meters does the shortcut save?

10

Height of an isosceles triangle

An isosceles triangle has two sides of 13 cm and a base of 10 cm. Find its height to the base, then its area.

11

Distance between two points

Find the distance between $A(1, 2)$ and $B(9, 17)$.

12

Distance with negative coordinates

Find the distance between $P(-4, 3)$ and $Q(8, -2)$.

13

A triangle with decimal sides

A triangle has sides 1.5 cm, 2 cm and 2.5 cm. Is it a right triangle? If so, which side is opposite the right angle?

14

Flight of a drone

A drone takes off, flies 120 m due east, then 50 m due north. (a) How far is it from its starting point in a straight line? (b) How long is the whole trip if it then flies straight back?

15 Will the rod fit in the box?

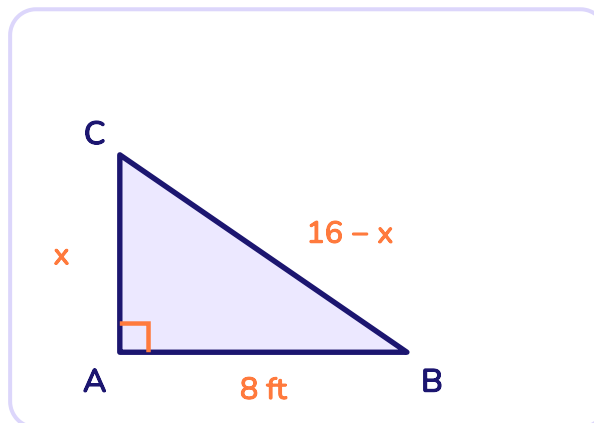
★★★

A shipping box is 12 in by 16 in by 21 in. (a) Find the length of its space diagonal. (b) Can a straight rod 28 in long fit inside? What about a 30 in rod?

16 The broken tree

★★★

A 16 ft tree snaps at a point x feet above the ground. The top bends over and touches the ground 8 ft from the base of the trunk. At what height did the tree break?

**17 Area and perimeter from a hypotenuse**

★★★

A right triangle has hypotenuse 25 cm and one leg 7 cm. Find the other leg, the perimeter and the area.

18 A right angle in the coordinate plane

★★★

Let $A(0, 0)$, $B(4, 3)$ and $C(-3, 4)$. Compute AB^2 , AC^2 and BC^2 . Is triangle ABC a right triangle? Where is the right angle?

19 Diagonal of a square

★★★

The diagonal of a square is 14 cm. Find the exact side length, then its approximate value to the nearest hundredth, and the area of the square.

20

Height of an equilateral triangle

★★★

An equilateral triangle has side 10 cm. Find its height and its area, rounded to the nearest hundredth.

21

Distance in 3D coordinates

★★★

In three-dimensional space, find the distance between $P(1, 2, 3)$ and $Q(3, 6, 7)$.

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