

6 Pythagoras' theorem – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English

Write it 3 times (English)

right-angled triangle

hypotenuse

Pythagoras' theorem

Recall

In a **right-angled triangle**, the longest side (opposite the right angle) is the **hypotenuse**.

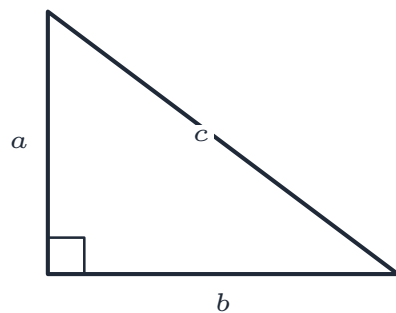
New ideas

Read these first, then do the Practice.

■ 1 Pythagoras' theorem

Pythagoras' theorem

links the three sides:

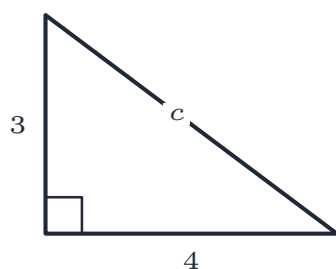


$$a^2 + b^2 = c^2$$

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■ 2 Finding the hypotenuse

To find the hypotenuse, square the two shorter sides, add, then take the square root:



$$\begin{aligned} c^2 &= 3^2 + 4^2 = 25 \\ c &= \sqrt{25} = 5 \end{aligned}$$

Watch out: Pythagoras only works in a **right-angled** triangle, and c must be the **hypotenuse** (the longest side, opposite the right angle). To find the hypotenuse: square both shorter sides, **add**, then square-root.

Practice

Try these in order.

6.1 In a right-angled triangle, what is the *hypotenuse*?

[1]

6.2 Write down Pythagoras' theorem.

[1]

6.3 A right-angled triangle has shorter sides 6 cm and 8 cm. Find the hypotenuse. [2]

6.4 Find the hypotenuse of a triangle with shorter sides 5 cm and 12 cm. [2]

6.5 Is a triangle with sides 3, 4 and 5 right-angled? Explain. [1]

6.6 Challenge. A rectangular field is 40 m long and 30 m wide. Find the length of the diagonal path straight across it. [3]