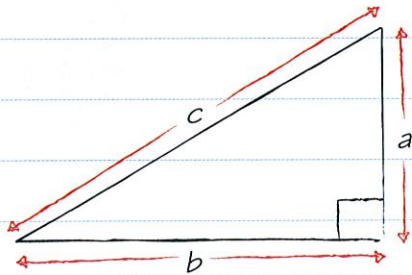


A\*  
A  
B  
C  
D

# Pythagoras' theorem

Pythagoras' theorem is a really useful rule. You can use it to find the length of a missing side in a right-angled triangle.



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

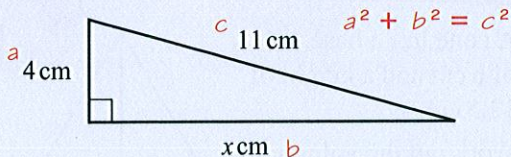
### Pythagoras checklist

- short<sup>2</sup> + short<sup>2</sup> = long<sup>2</sup>
- Right-angled triangle.
- Lengths of two sides known.
- Length of third side missing.
- Learn this. It's not on the formula sheet.

### Worked example

grade C

Work out the length of the missing side.



$$4^2 + x^2 = 11^2$$

$$x^2 = 11^2 - 4^2$$

$$= 121 - 16 = 105$$

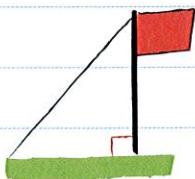
$$x = \sqrt{105} = 10.2 \text{ (to 1 d.p.)}$$

So  $x = 10.2 \text{ cm}$

Be really careful when the missing length is one of the **shorter** sides.

1. Label the longest side of the triangle  $c$ .
2. Label the other two sides.
3. Substitute the values into the formula.
4. Rearrange and solve.
5. Write units with your answer.

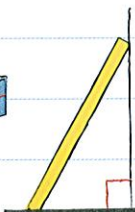
Pythagoras questions come in lots of different forms. Just look for the right-angled triangle.



Flagpoles



Ramps



Ladders

### Calculator skills

Use these buttons to find squares and square roots with your calculator.



You might need to use the **S $\div$ D** key to get your answer as a decimal number.

### Now try this

edexcel

Calculate the area of this right-angled triangle.

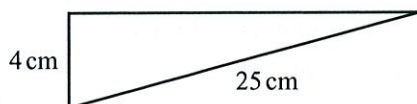


Diagram NOT accurately drawn

(3 marks)

You need to find the length of the missing side before you can find the area of the triangle. You know the lengths of the other two sides and the triangle is right-angled, so you can use Pythagoras' theorem. For a reminder about areas of triangles have a look at page 55.

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