

## Pythagoras

### Solving Problems with Pythagoras' Theorem

Draw a diagram each time to help you understand your methods and answers.

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#### Question 1.

An aircraft flies 80 km due north. It then flies 72 km due west.

Calculate how far the aircraft would have travelled had it taken the direct route.

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#### Question 2.

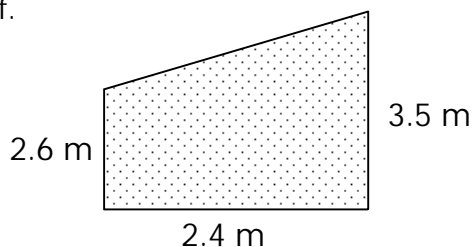
A ladder of 8 m is placed against a wall so that the foot of the ladder is 2 m away from the bottom of the wall.

Calculate how far up the wall the ladder reaches.

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#### Question 3.

The diagram shows the side wall of a shed. Calculate the length of the sloping roof.

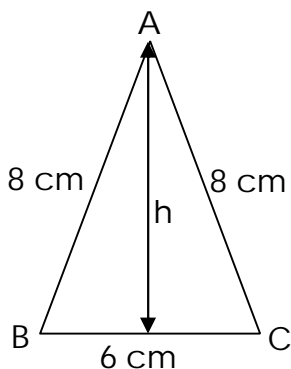


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#### Question 4.

ABC is an isosceles triangle.

- Calculate the perpendicular height,  $h$ .
- Hence calculate the area of this triangle.



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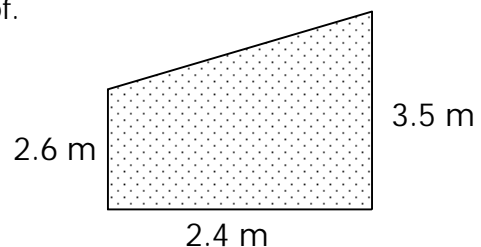
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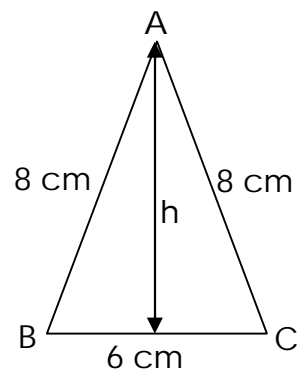


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**Extension Work****Pythagorean Triples**

Each set of three numbers in the table below obey Pythagoras' theorem.

a	b	c
3	4	5
5	12	13
7	24	25

As you can see,  $a^2 + b^2 = c^2$ .

a, b and c are whole numbers (integers).

Each of these sets of numbers is called a Pythagorean triple, named after Pythagoras, who first discovered a formula for finding them.

**Your Task:**

- Continue the table to find other Pythagorean triples.
- Can you find the formula which Pythagoras discovered, giving b and c when the value of a is known?
- Do multiples of any Pythagorean triples still give another Pythagorean triple?

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