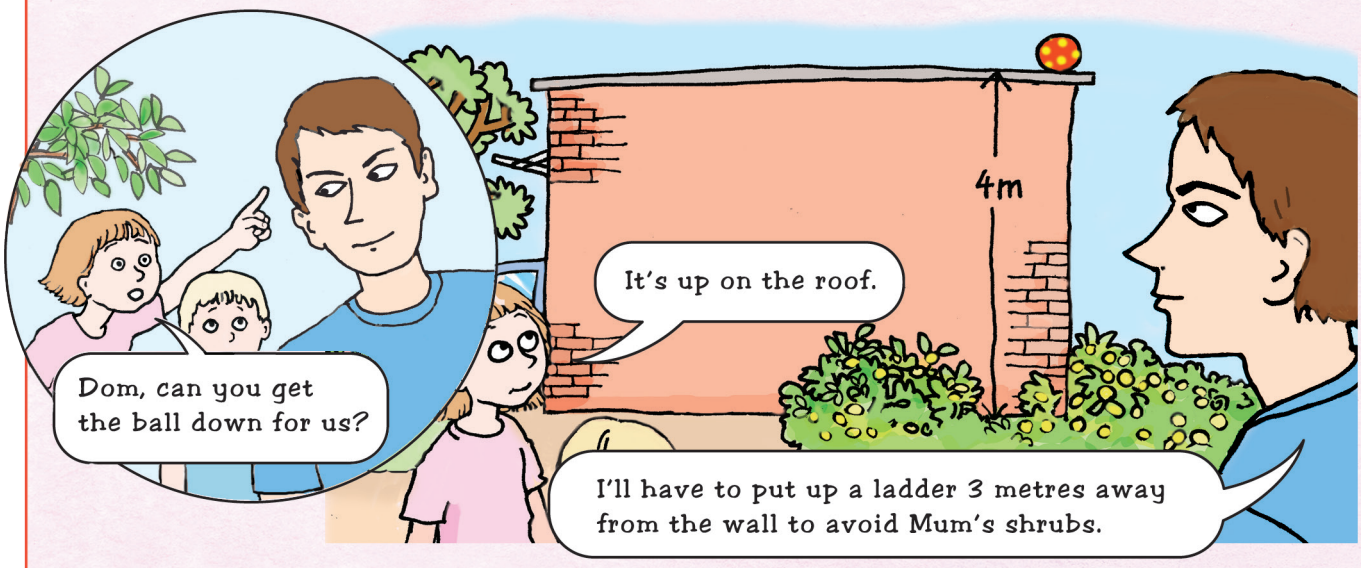
Pythagoras to the rescue

Using Mathomat to find the hypotenuse.



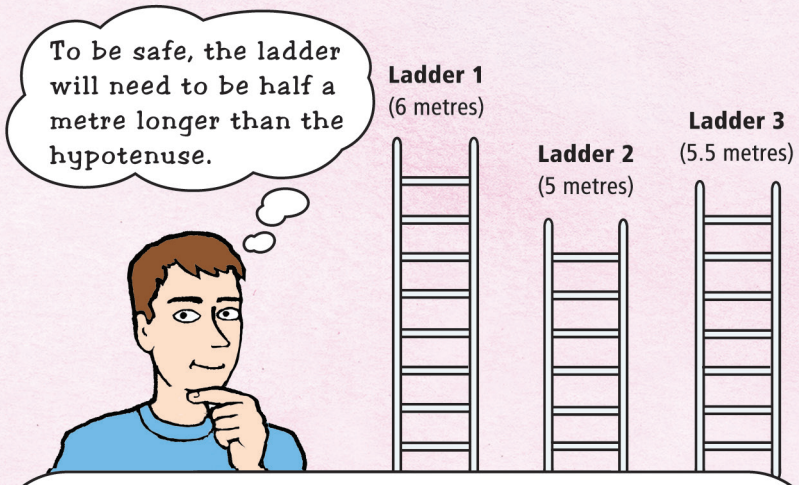
Which ladder?

Dom has a choice of three ladders. Which is the minimum length he needs to use?

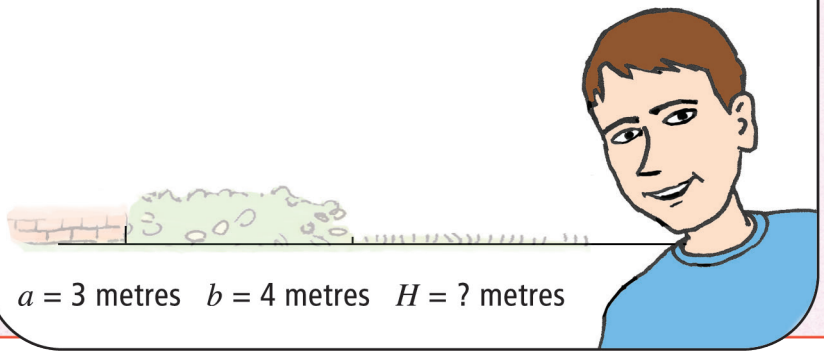
Before you decide, put Pythagoras' theorem to the test: $a^2 + b^2 = H^2$

How long is the hypotenuse?

When Dom puts up the ladder it will form the longest side of a right-angled triangle, the hypotenuse (H), with the wall and the ground. Calculate the square of the two shorter sides and add the products ($a^2 + b^2$). This, according to Pythagoras' theorem, equals the square of the hypotenuse (H^2). The length of the hypotenuse is the square root of H^2.



Using the perpendicular guide, make a scale drawing of the triangle. Does it match your calculation?



a = 3 metres b = 4 metres H = ? metres

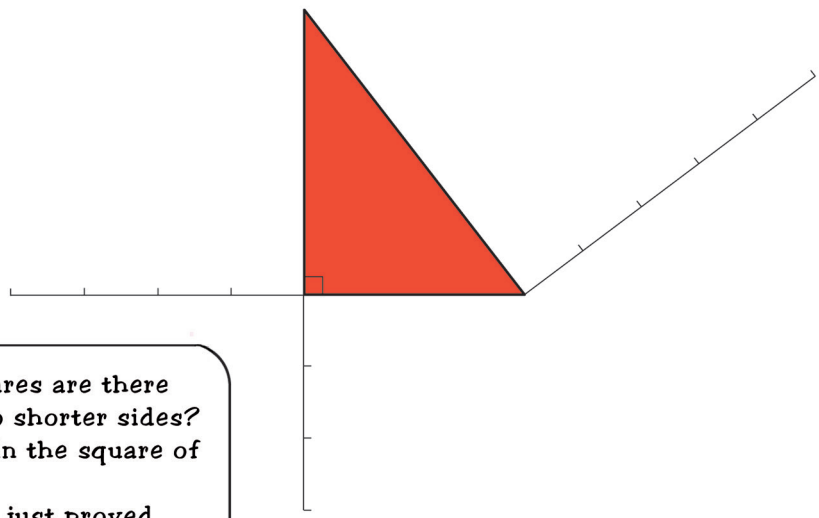
Using your Mathomat to prove Pythagoras' theorem

In any right-angled triangle the square of the area drawn on the hypotenuse is equal to the sum of the square areas of the other two sides.

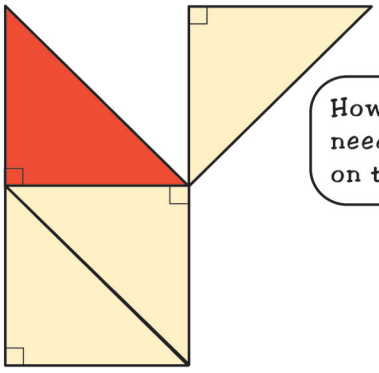
Complete this geometric proof of Pythagoras' theorem.

Use the start marks and the parallel guides to draw grids of small squares on each of the sides.

How many small squares are there altogether on the two shorter sides?
How many are there in the square of the hypotenuse?
If they match, you've just proved Pythagoras' theorem.



Here's another way to demonstrate Pythagoras' theorem.



Use shape 34 on your Mathomat to complete this proof.

How many triangles are needed to make the square on the hypotenuse?