

UNIT 3 *Pythagoras' Theorem*

Overhead Slides

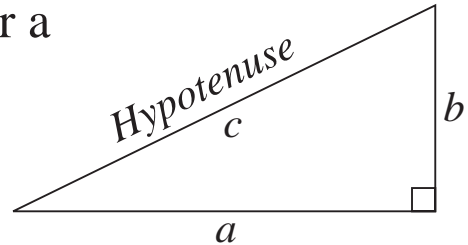
Overhead Slides

- 3.1 Pythagoras Theorem
- 3.2 Finding Right Angles
- 3.3 Length of the Hypotenuse
- 3.4 Diagonal of a Rectangle
- 3.5 Length of a Perpendicular Side
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OS 3.1

Pythagoras' Theorem

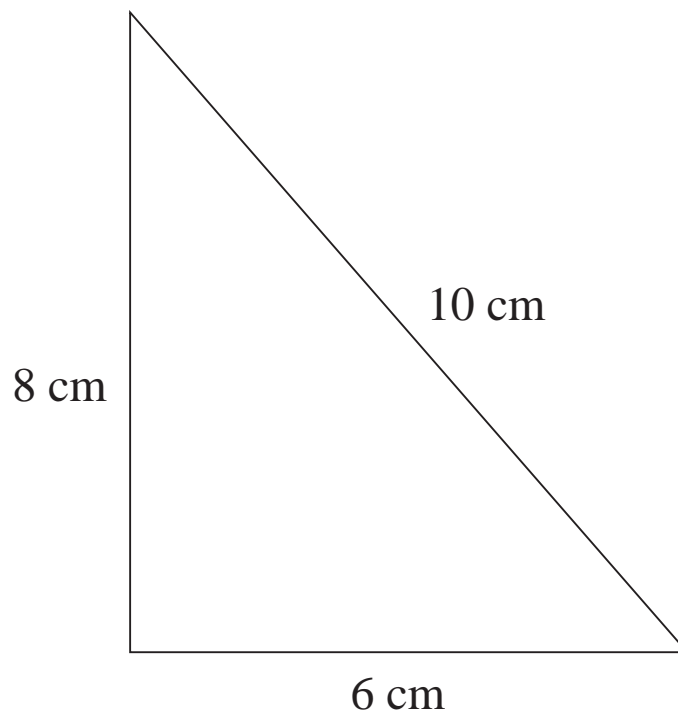
Pythagoras' Theorem states that, for a right-angled triangle, the square on the hypotenuse is equal to the sum of the squares on the two shorter sides.



Pythagoras' Theorem states that, for a right-angled triangle,

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

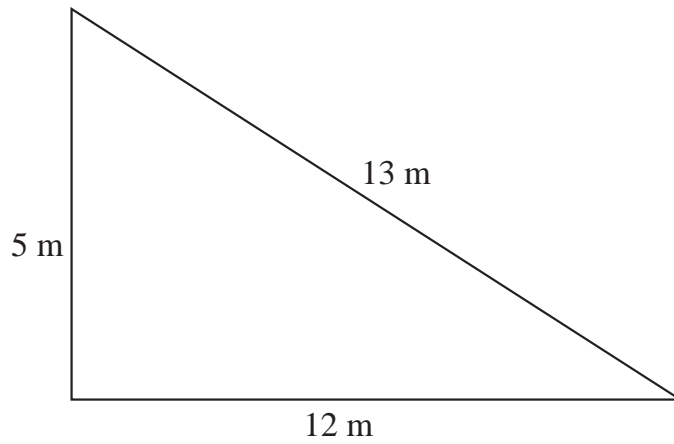
Does the following triangle contain a right angle?



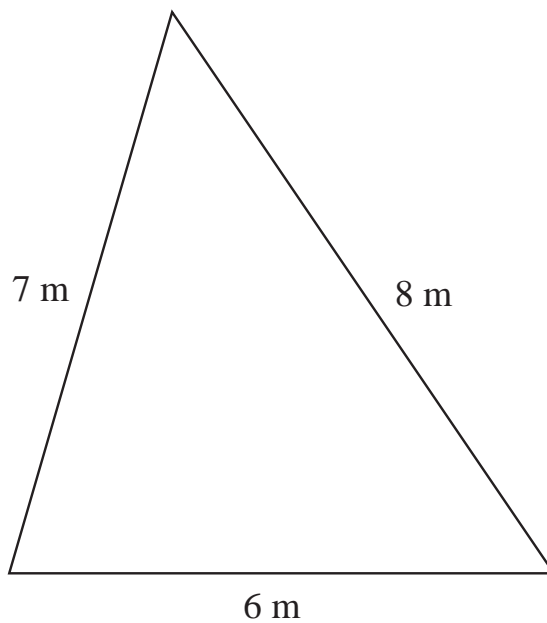
OS 3.2*Finding Right Angles*

Which of the triangles below contain a right angle?

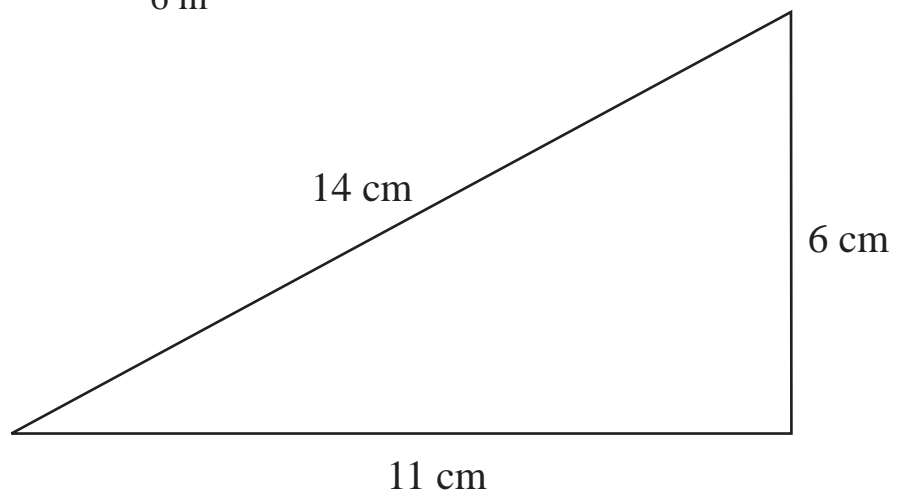
(a)



(b)

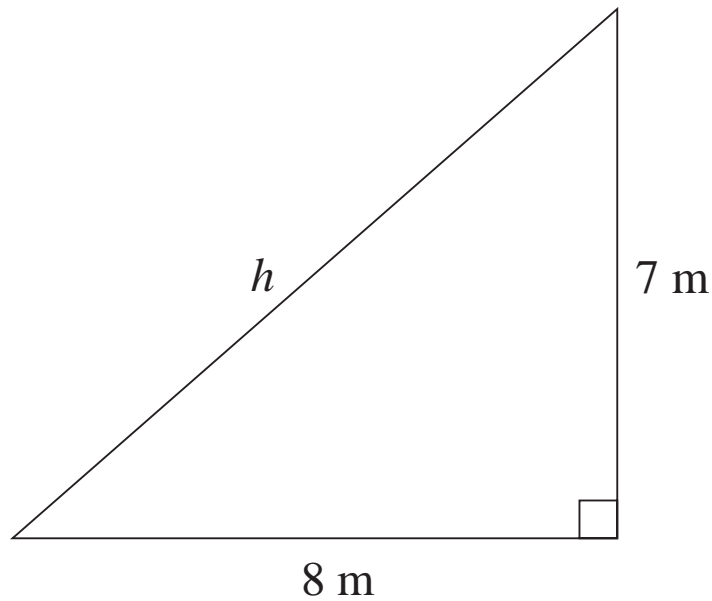


(c)



OS 3.3*Length of the Hypotenuse*

Calculate the length of the hypotenuse of a triangle in which the other two sides are of lengths 7 m and 8 m.



By Pythagoras' Theorem,

$$h^2 =$$

OS 3.4

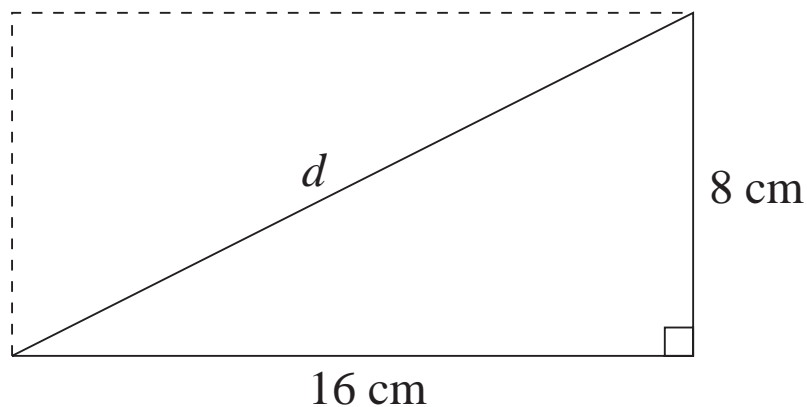
Diagonal of a Rectangle

Calculate the length of the diagonals of the following rectangle:



The diagram below shows the triangle that needs to be considered.

The hypotenuse is the diagonal of the rectangle.

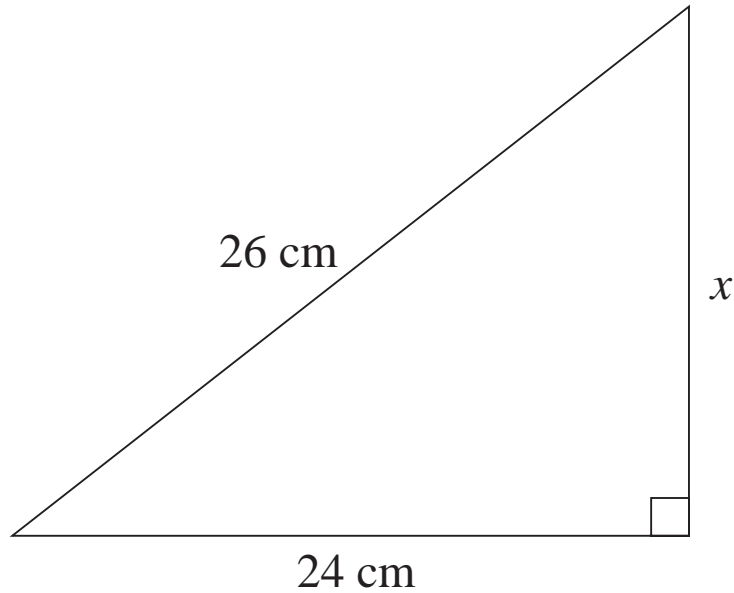


By Pythagoras' Theorem,

$$d^2 =$$

OS 3.5*Length of a Perpendicular Side*

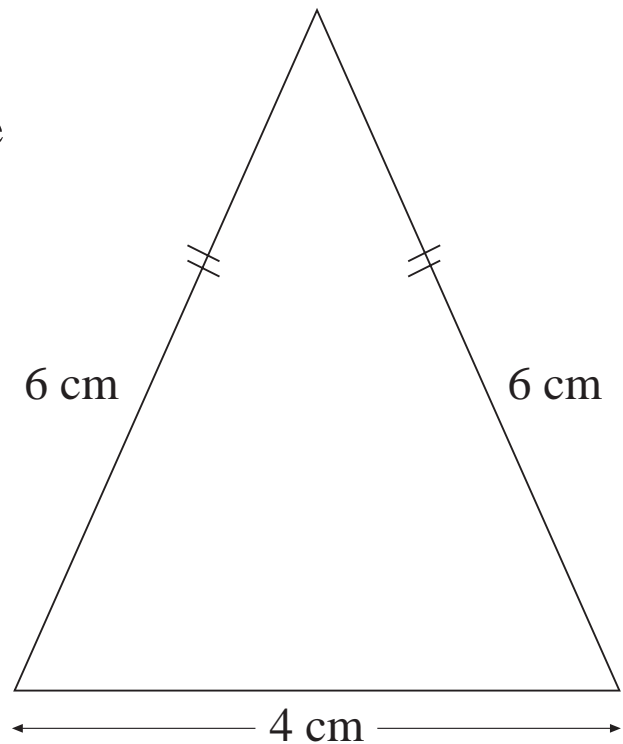
Calculate the length of the side marked x in the following triangle:



By Pythagoras' Theorem,

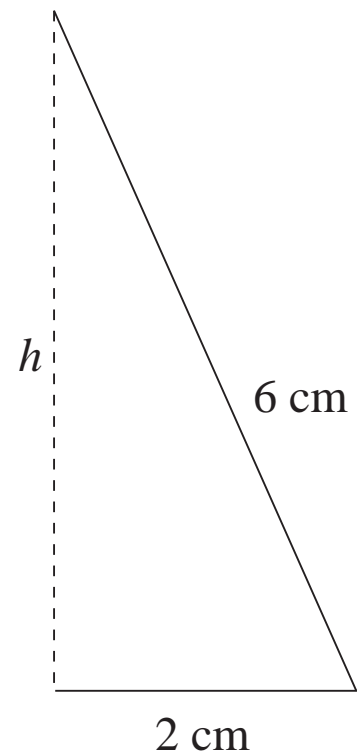
OS 3.6*Height of an Isosceles Triangle*

Calculate the perpendicular height of the isosceles triangle opposite:



The height can be calculated by using this triangle.

By Pythagoras' Theorem:



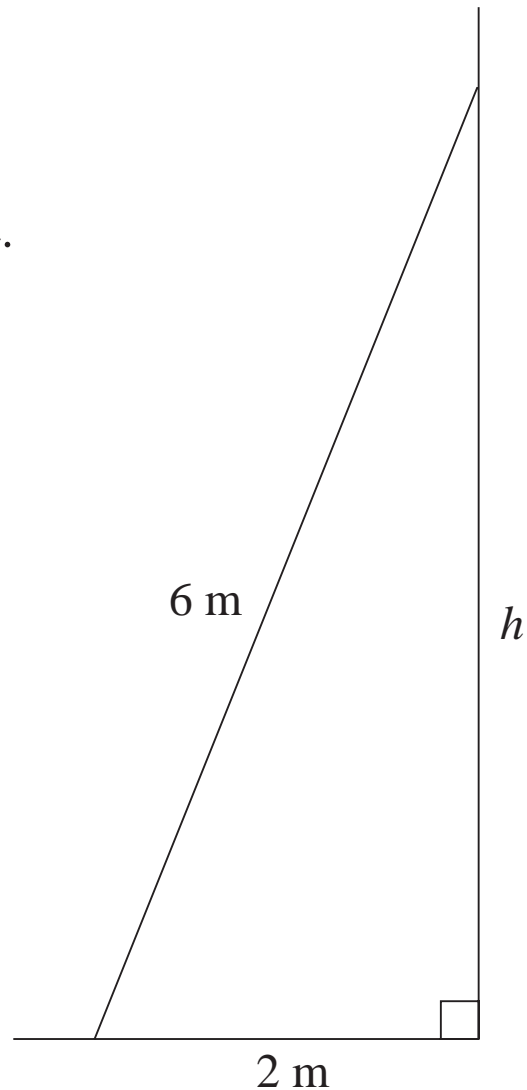
OS 3.7*Ladder Problems*

A ladder is 6 m long. The bottom of the ladder is 2 m from the foot of a wall, and the top leans against the wall. How high is the top of the ladder above the ground?

The first step is to draw a triangle.

The height of the wall to the top of the ladder has been labelled h .

Now use Pythagoras' Theorem:

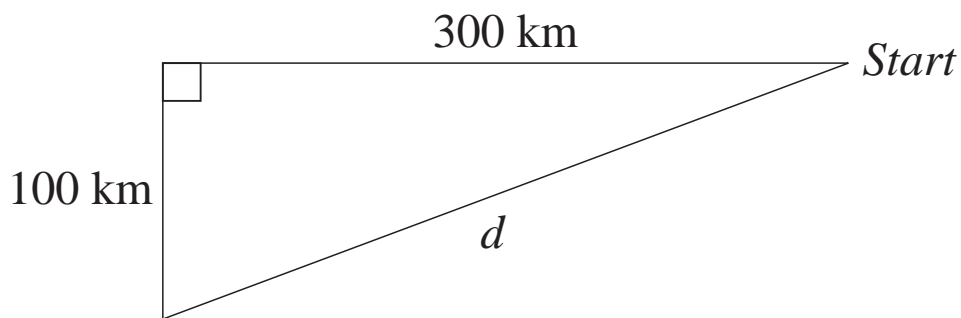
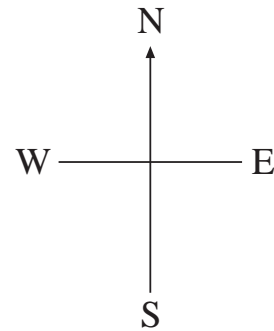


OS 3.8

Navigation Problems

A ship sails 300 km due west and then 100 km due south.
How far is the ship from the starting position?

The first step is to draw a diagram showing the ship's journey:



The distance from the starting point has been labelled d .

Now use Pythagoras' Theorem: