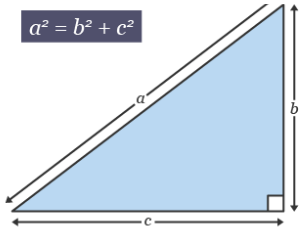
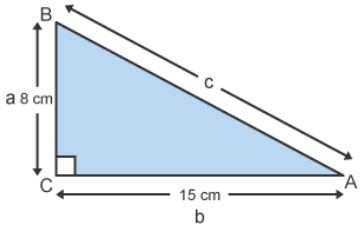
S2 Pythagoras Theorem

To calculate the length of a side on a right-angled **triangle** when you know the sizes of the other two, you need to use Pythagoras' Theorem.

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



Calculate the length of the hypotenuse AB.



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

$c^2 = 8^2 + 15^2$

$c^2 = 64 + 225$

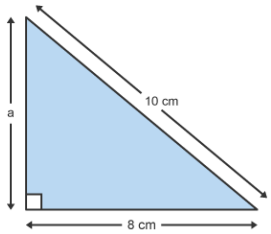
$c^2 = 289$

$c = \sqrt{289}$

$c = 17\ cm$

Calculating the length of one of the shorter sides

Calculate the length a.



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

$10^2 = a^2 + 8^2$

$100 = a^2 + 64$

Subtract 64 from both sides to make a^2 the subject:

$100 - 64 = a^2$

$36 = a^2$

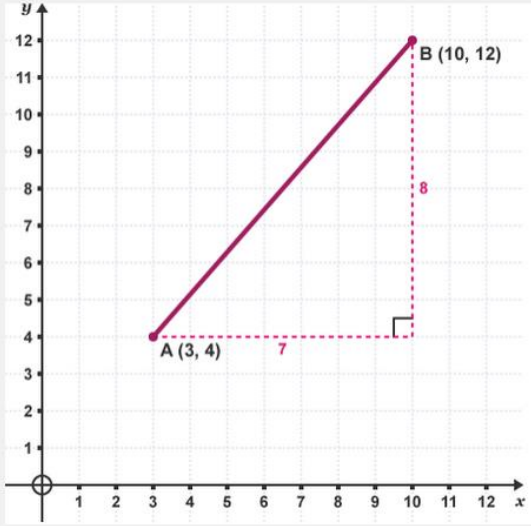
$a = \sqrt{36}$

$a = 6\ cm$

Using Pythagoras with coordinates

We can also use Pythagoras to find the distance between two points.

Join up A and B to show the line AB then form a right-angled triangle.



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

$a^2 = 8^2 + 7^2$

$a^2 = 64 + 49$

$a^2 = 113$

$a = \sqrt{113}$

$a = 10.6\ units\ (to\ 1\ d.p.)$

The length of AB is 10.6 units.