THE RAINBOW FLAG AWARD CLASSROOM

Helping you to deliver an LGBT+ INCLUSIVE CURRICULUM

Subject: Maths

Key Stage: 4

PYTHAGORAS' THEOREM

Original 'The Classroom' concept developed by Schools OUT UK

classroom
We embrace diversity and bring OUT the best in everyone

Schools OUT UK
The LGBT Education Charity
Charitable Incorporated Organisation Number1156352

Title: Pythagoras' Theorem

Curriculum links:

KS4 National curriculum

Apply Pythagoras' Theorem and trigonometric ratios to find angles and lengths in right-angled triangles (**and, where possible, general triangles**) in two (**and three**) dimensional figures.

LIs:

State Pythagoras' Theorem as a short equation.

Calculate the length of the hypotenuse using the equation.

Apply and rearrange the equation to real-life situations to find missing values.

Instructions for use:

Most tasks have been differentiated to three levels with the orange boxed task being the easier of the three and the grey being the more challenging.

For mixed ability classes we suggest keeping all tasks and directing your students towards their appropriate level. For setted classes you can delete the tasks you feel are not appropriate.

Throughout we have added questions in orange that can be used to prompt conversation, draw further information from your students and deepen their understanding.

Please feel free to edit the order of the slides so this lesson is consistent with your approach.

Additional information can be found in the notes section of each slide.

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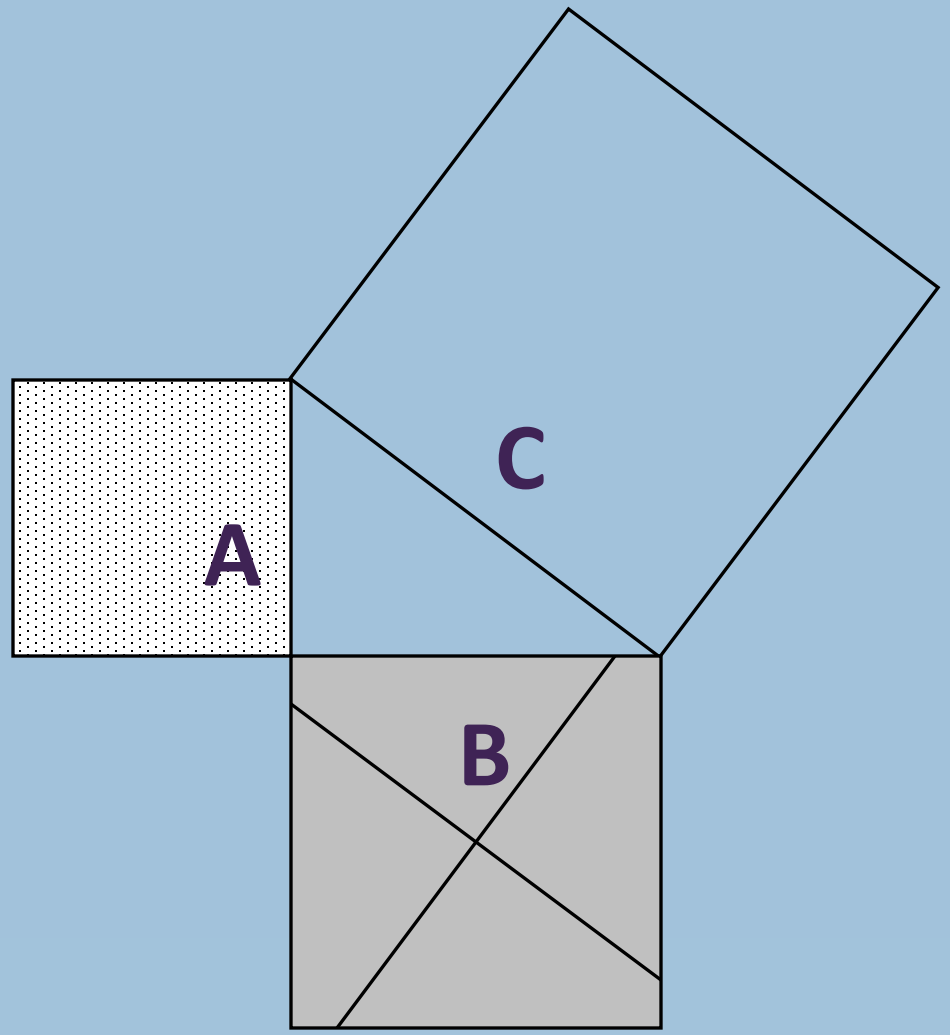
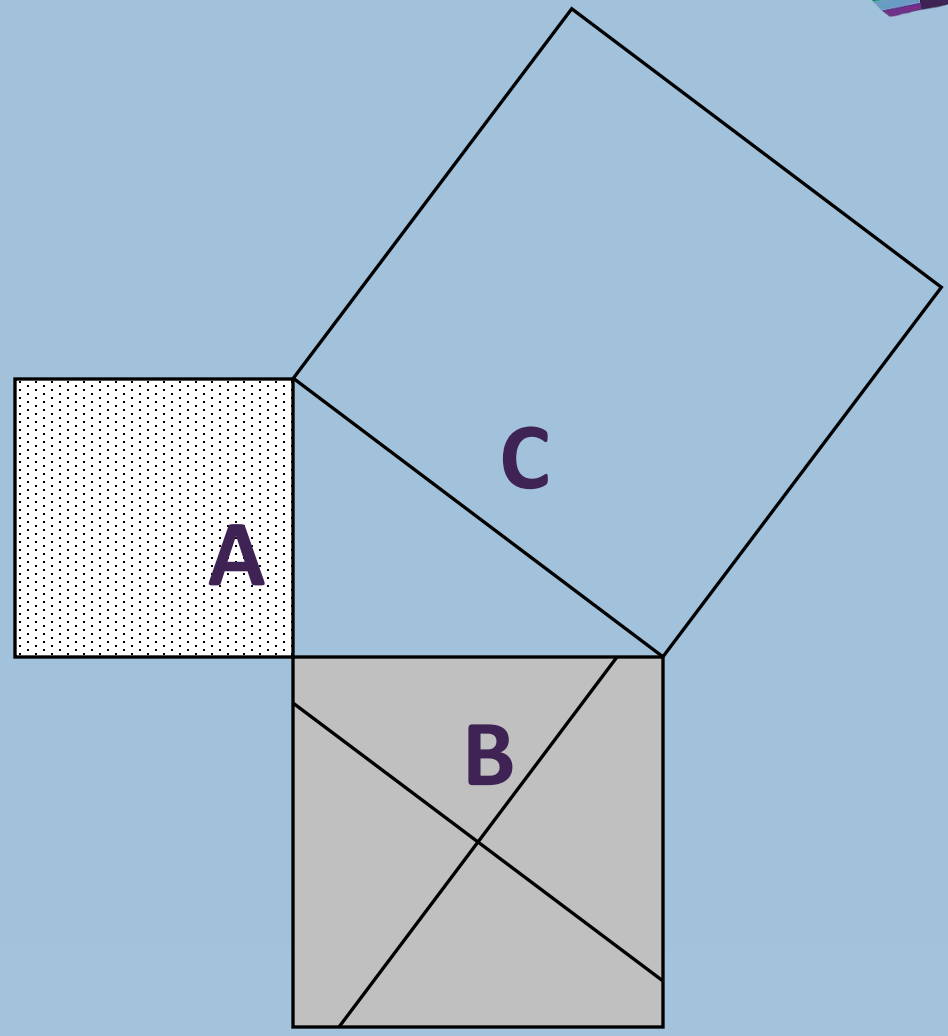




STARTER

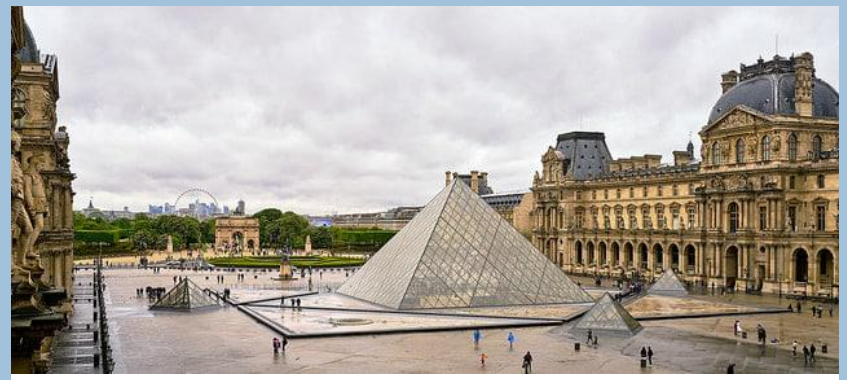
We can use Pythagoras' Theorem to calculate the lengths of the sides of a right-angled triangle

Where can we find examples of triangles being used?

What do you know about the shape of triangles?

Progress...

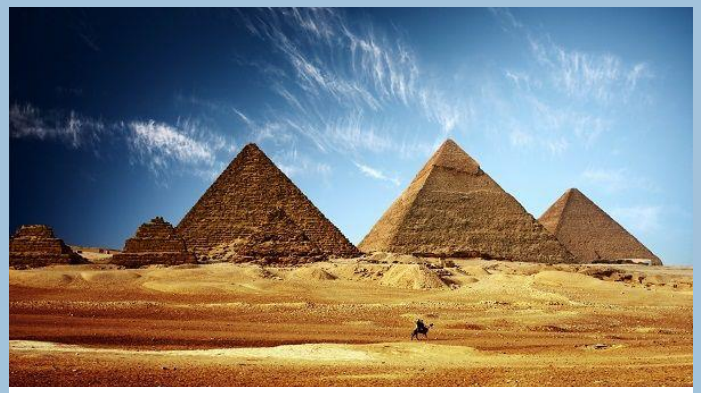
STARTER



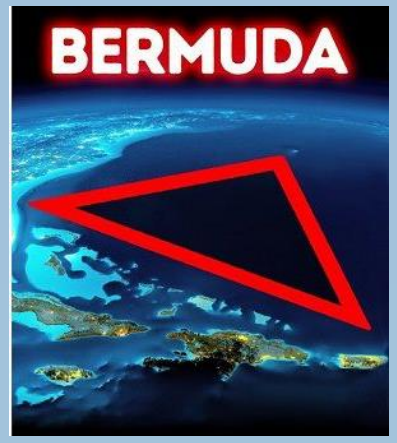
Triangles provide strength and stability so are often used in architecture

Doritos

Some members of the LGBT+ community wear a pink triangle with pride. It is a symbol used to remember those persecuted on account of their identity, in the Holocaust



The pyramids

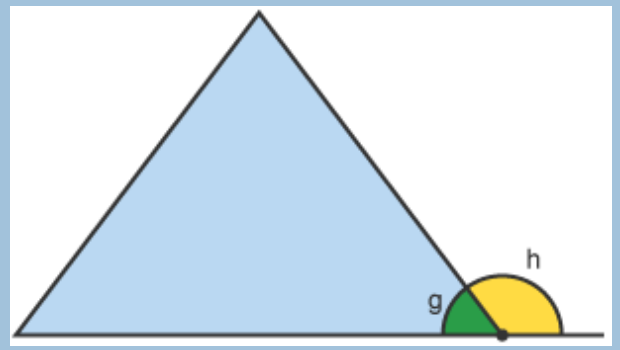


Progress...

STARTER

Acute Triangle All three angles are acute (less than 90°).	**Equilateral Triangle** All three sides are congruent (same size).
Right Triangle One of the angles is a right angle (90°).	**Isosceles Triangle** Two sides are congruent (same size).
Obtuse Triangle One of the angles is an obtuse angle (180°).	**Scalene Triangle** No sides are congruent(same size).

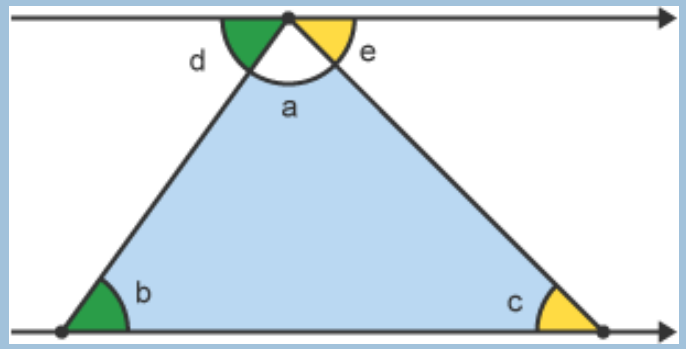
A triangle is a 2-D polygon with three sides.



$g + h = 180°$

$d + a + e = 180°$

$a + b + c = 180°$



Area = ½ x base x height

BIG PICTURE

If a firefighter has to reach a window 12m above the ground and their ladder is 15m long, how far from the bottom of the wall should they put their ladder?

LEARNING INTENTIONS

Title: Pythagoras' Theorem **Date: Thursday, 01 February 2024**

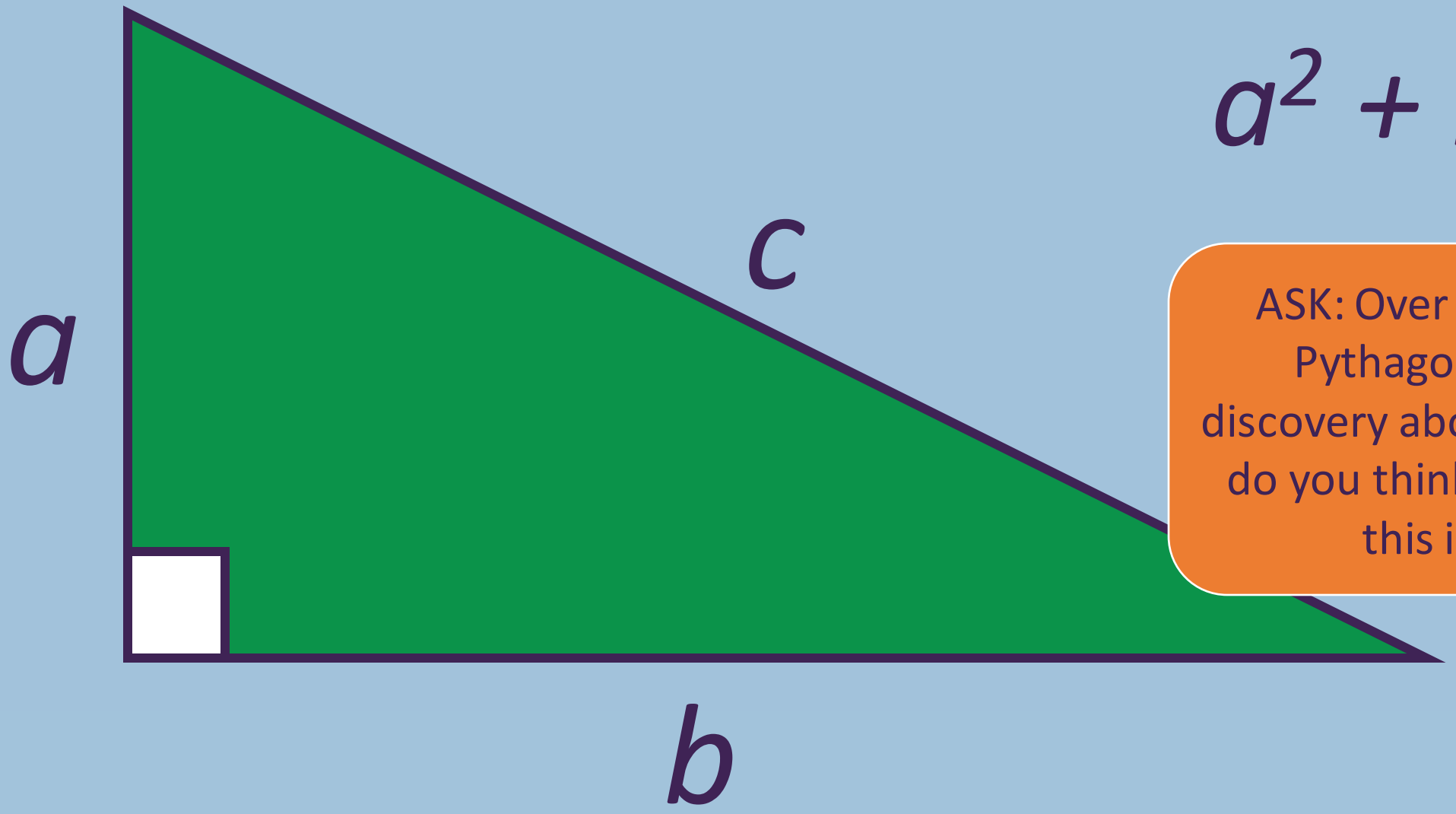
State Pythagoras' Theorem as a short equation

Calculate the length of the hypotenuse using the equation

Apply and rearrange the equation to real-life situations to find missing values

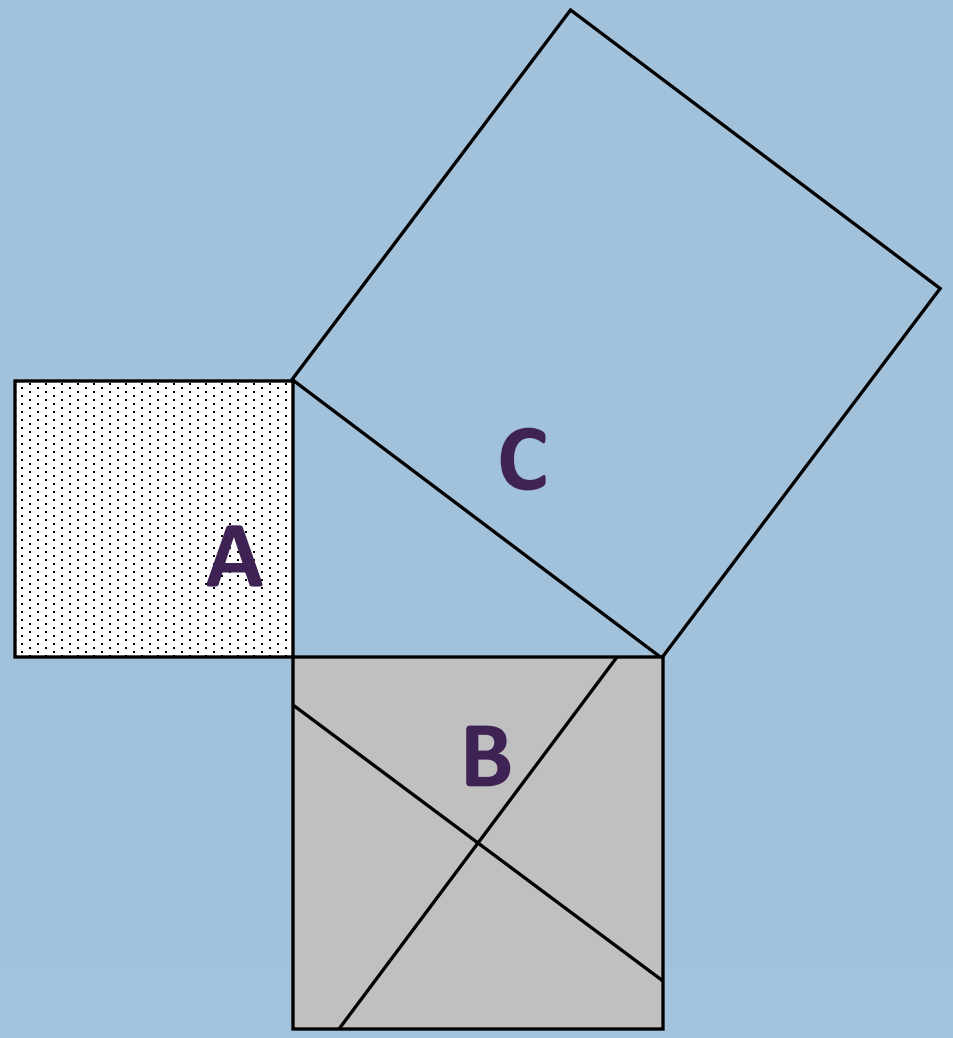
NEW MATERIAL

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



ASK: Over 2000 years ago Pythagoras made this discovery about triangles. How do you think we could prove this is correct?

PROVE IT



1. Carefully cut out the whole shape
2. Cut off squares A and B
3. Cut along the lines inside square B to split it into four pieces
4. You should be able to arrange square A and the four pieces of square B so they all fit inside of square C

Progress...

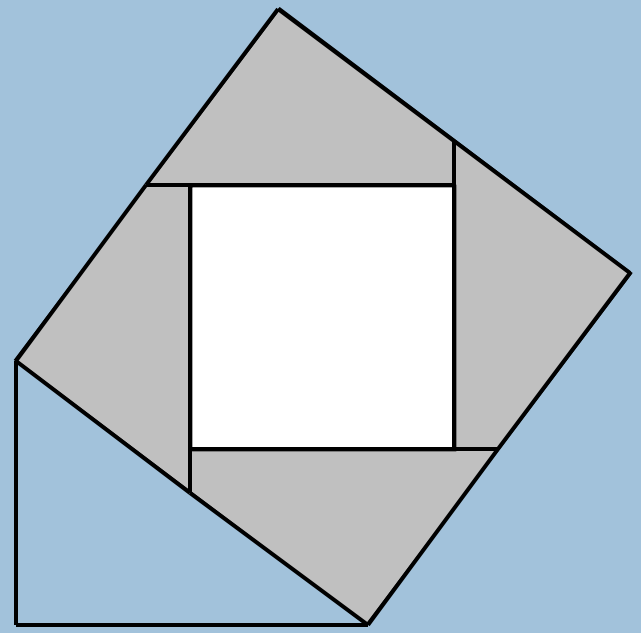
PROVE IT

By fitting squares A and B inside of square C we have proven that:

Area of A + Area of B = Area of C

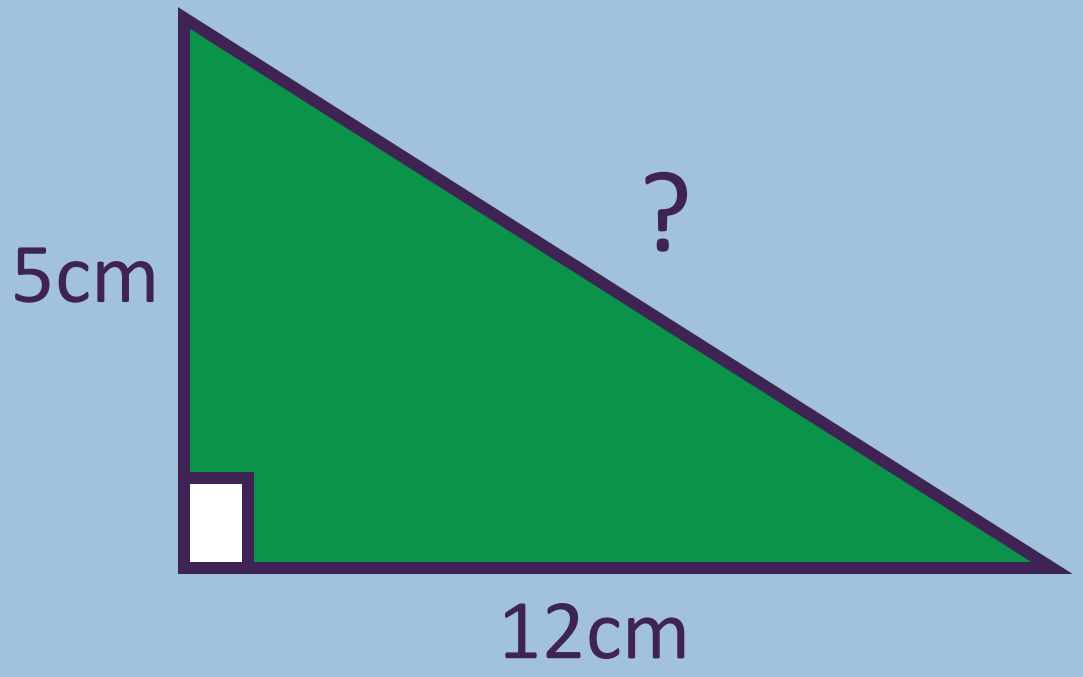
Which we can write as:

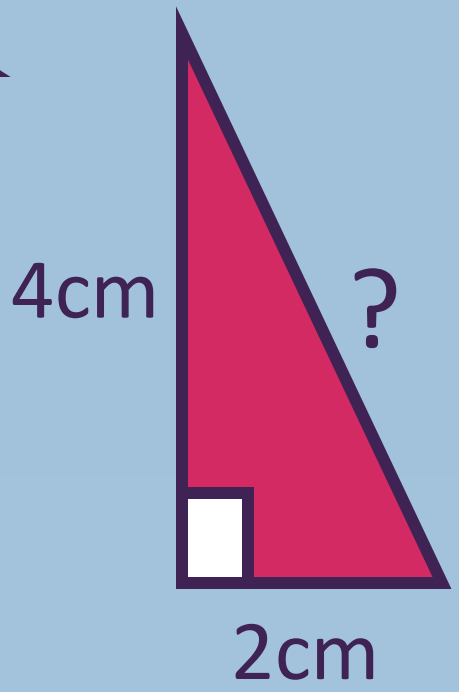
$a^2 + b^2 = c^2$

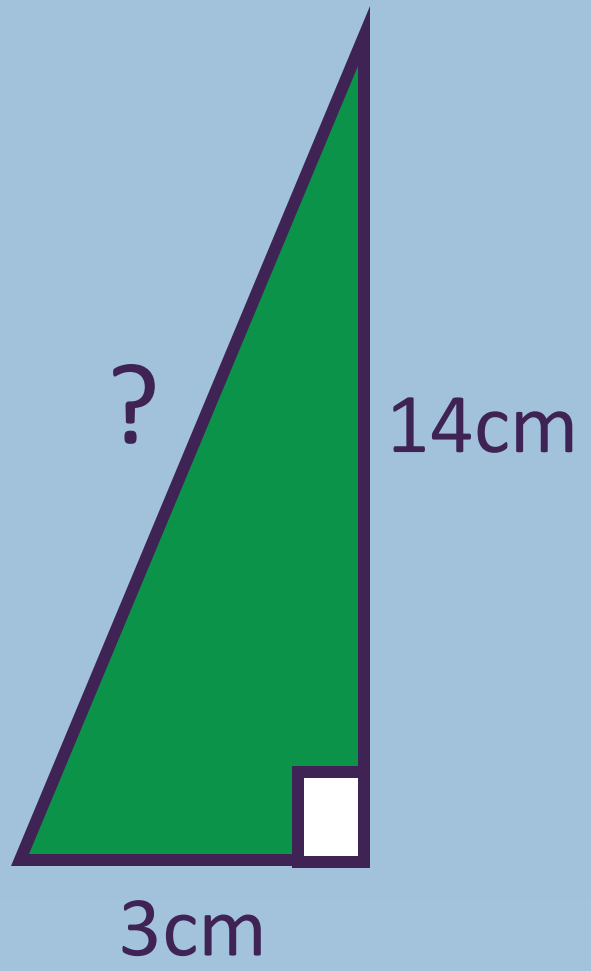


ASK: How would we calculate?

REVIEW AND REFLECT

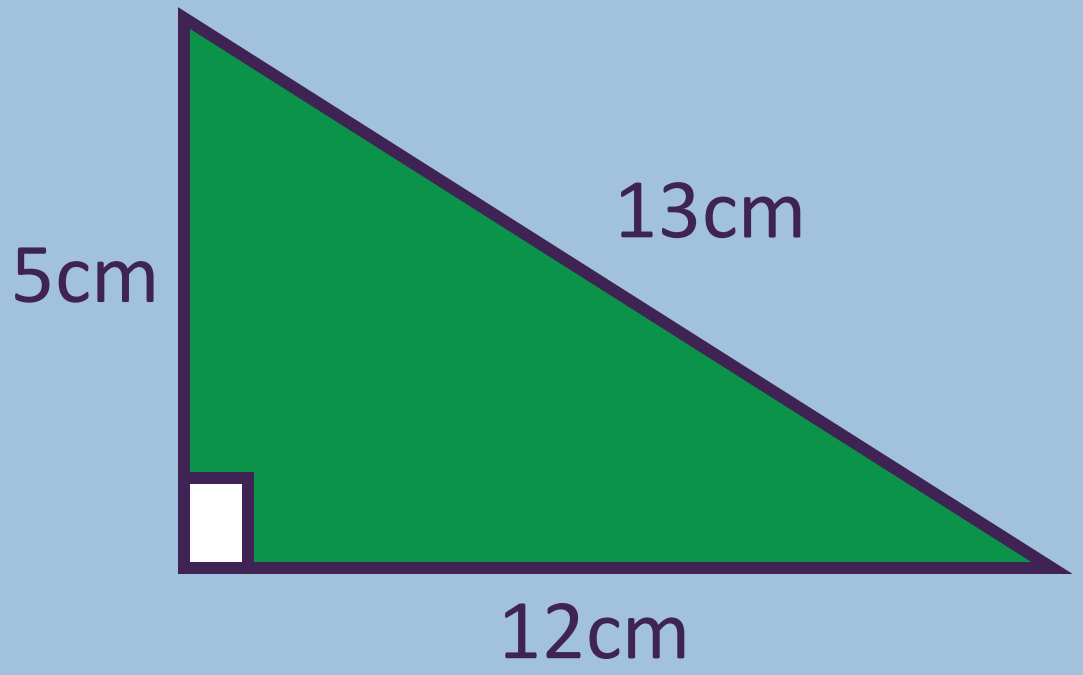


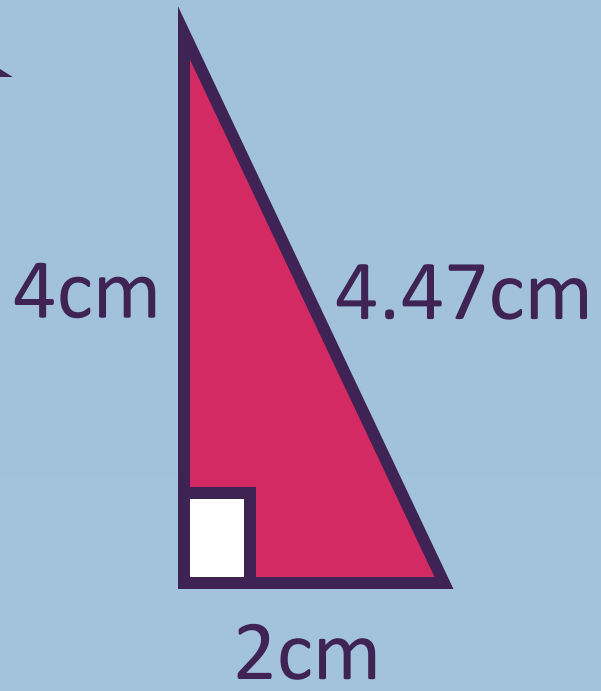


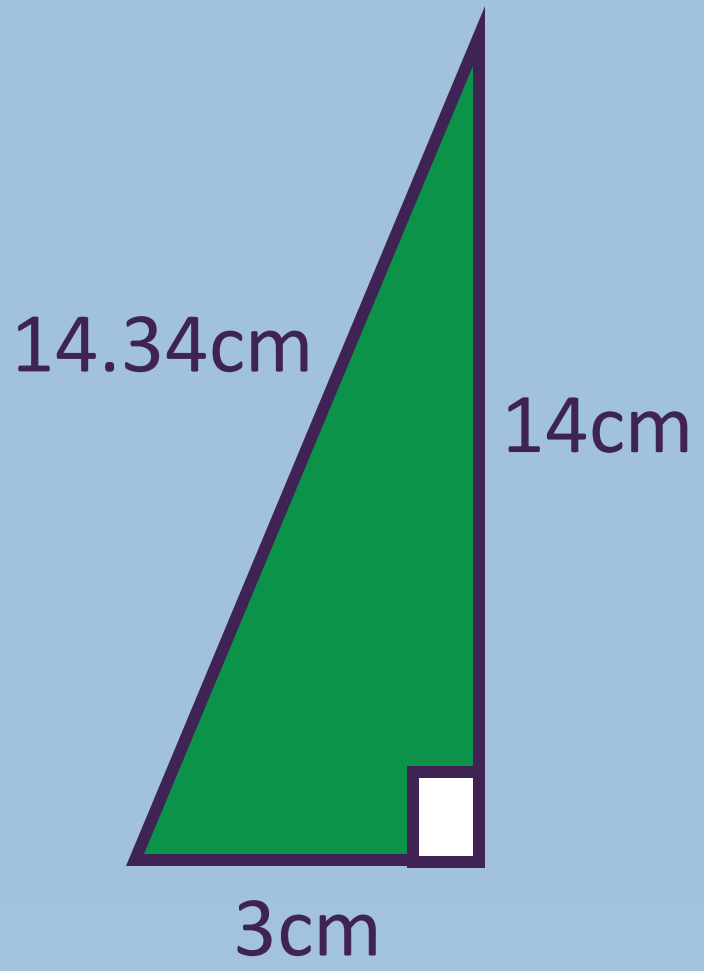


Progress...

REVIEW AND REFLECT







WHITEBOARDS

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

Rearrange the equation for:

$a =$

$b =$

Progress...

WHITEBOARDS

THE RAINBOW FLAG AWARD CLASSROOM

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

$$a = \sqrt{c^2 - b^2}$$

$$b = \sqrt{c^2 - a^2}$$

REVIEW AND REFLECT

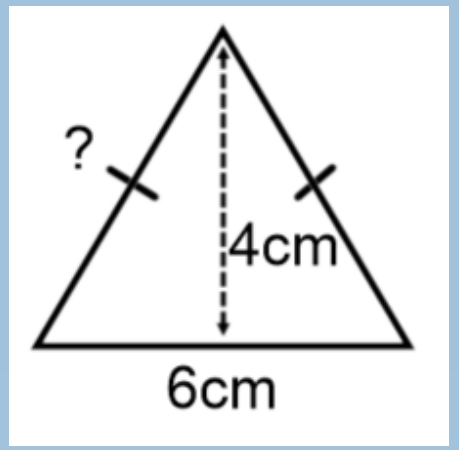
1. a= 15cm b=?
   c= 17cm

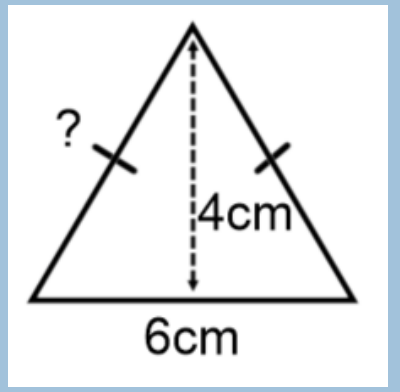
2. a= 4cm b=
   8cm c=?

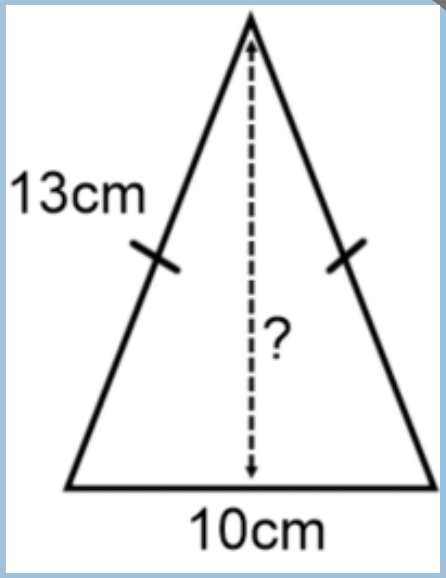
3. a=? b= 10cm
   c= 12cm

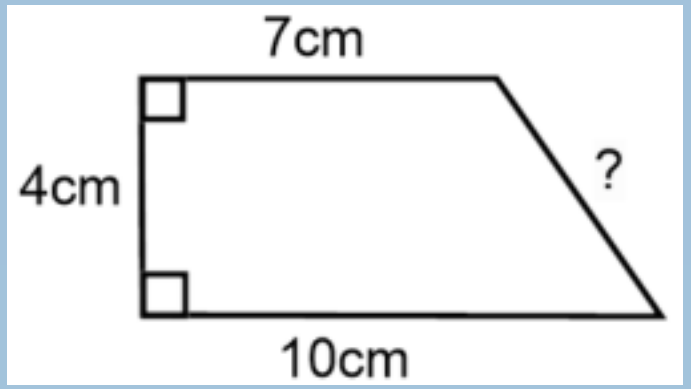
1. a=? b= 13.5cm
   c= 14.6cm

2. a= 3.4cm b=
   7.1cm c=?

3. 





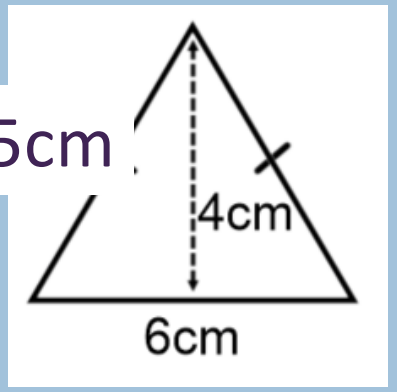


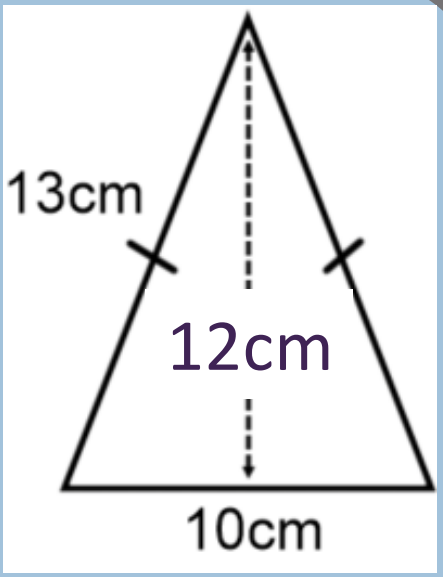
Progress...

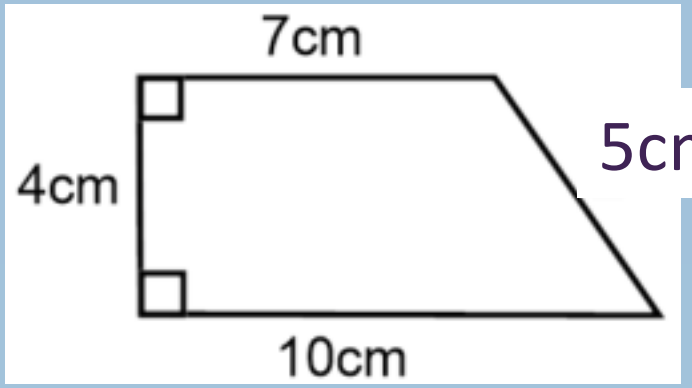
REVIEW AND REFLECT

1. b= 8cm
2. c= 8.94cm
3. a= 6.63cm

1. a= 5.56cm
2. c= 7.87cm
3. ?= 5cm

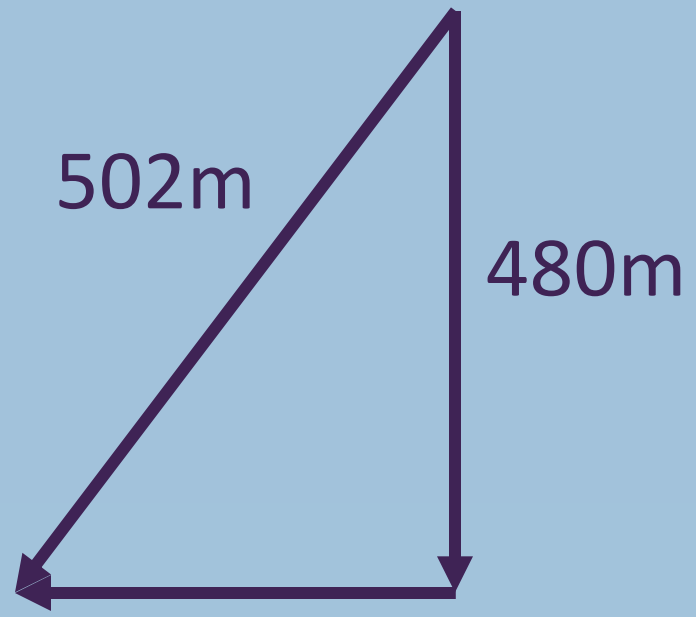




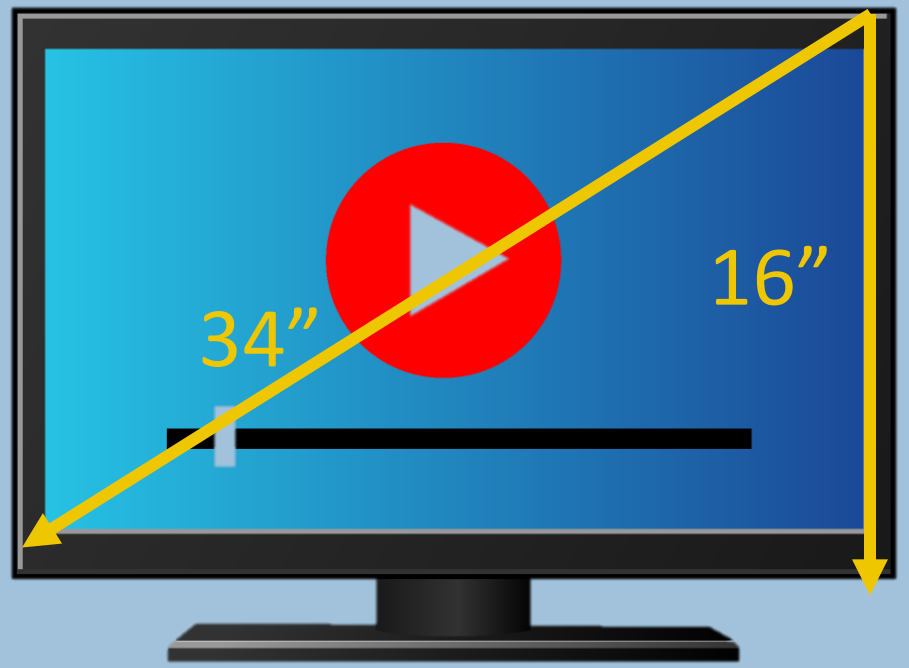


DEEPEN YOUR UNDERSTANDING

Justice's house is exactly 502m from school. To get home they walk 480m south and then they walk west. How far west do they have to walk?

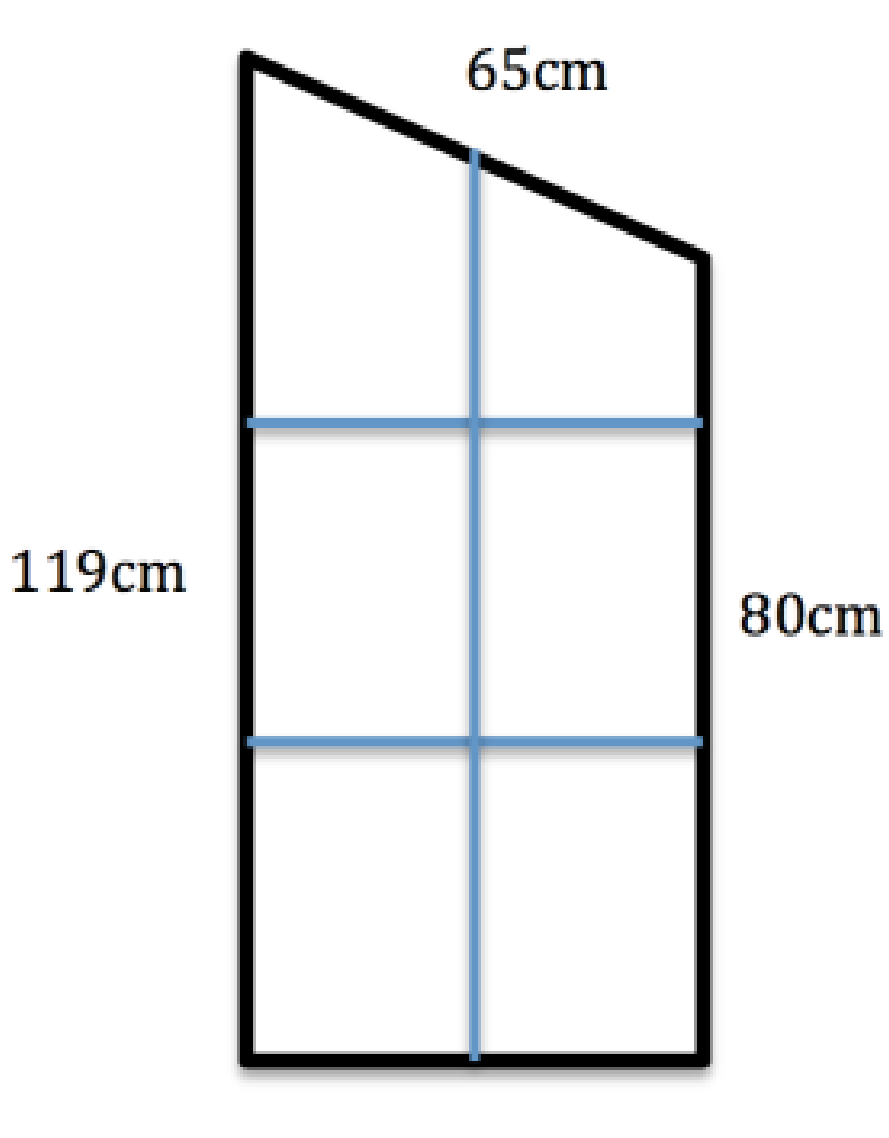


DEEPEN YOUR UNDERSTANDING



Aisha and her girlfriend are buying a TV. It has a 34 inch screen and is 16 inches tall. Her TV cabinet is 19 inches wide. Will it fit?

DEEPEN YOUR UNDERSTANDING



Mr and Mr Jacobs have an oddly shaped window in their home. It has the measurements shown. They want to buy a curtain for the window; how wide should the curtain be?

Progress...

DEEPEN YOUR UNDERSTANDING

Justice's house is exactly 502m from school. To get home they walk 480m south and then they walk west. How far west do they have to walk?

146.98m

Aisha and her girlfriend are buying a TV. It has a 34 inch screen and is 16 inches tall. Her TV cabinet is 19 inches wide. Will it fit?

TV is 30 inches wide. No it will not fit

Mr and Mr Jacobs have an oddly shaped window in their home. It has the measurements shown. They want to buy a curtain for the window; how wide should the curtain be?

52cm

BIG PICTURE

If a firefighter has to reach a window 12m above the ground and their ladder is 15m long, how far from the bottom of the wall should they put their ladder?

Progress...

BIG PICTURE

If a firefighter has to reach a window 12m above the ground and their ladder is 15m long, how far from the bottom of the wall should they put their ladder?

9m