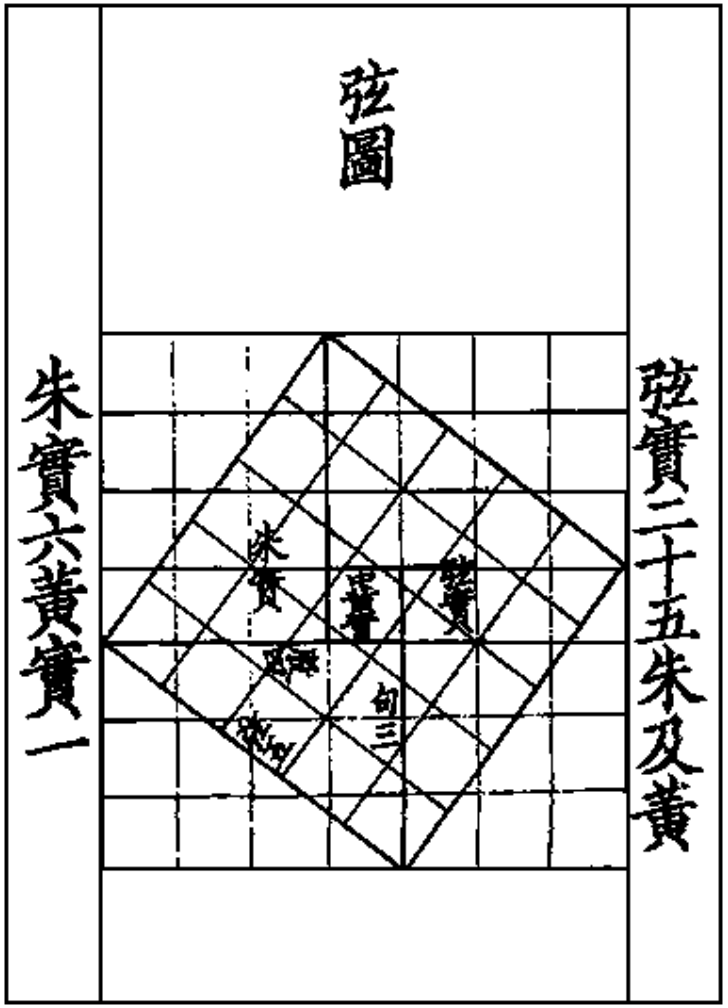
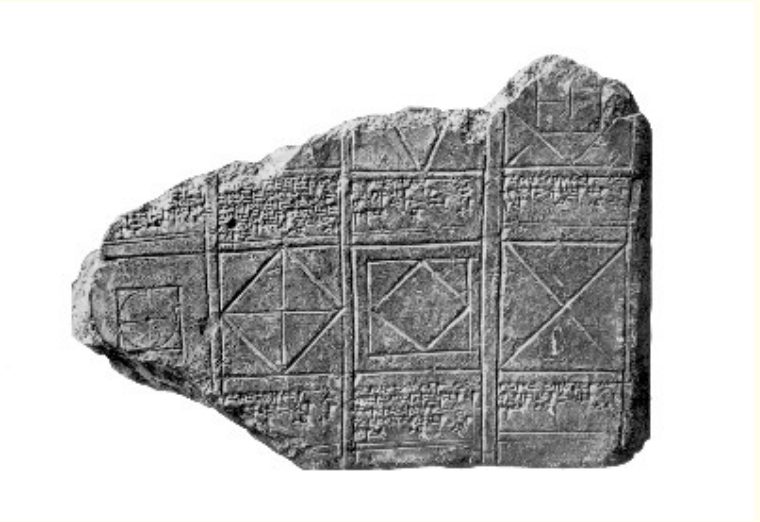
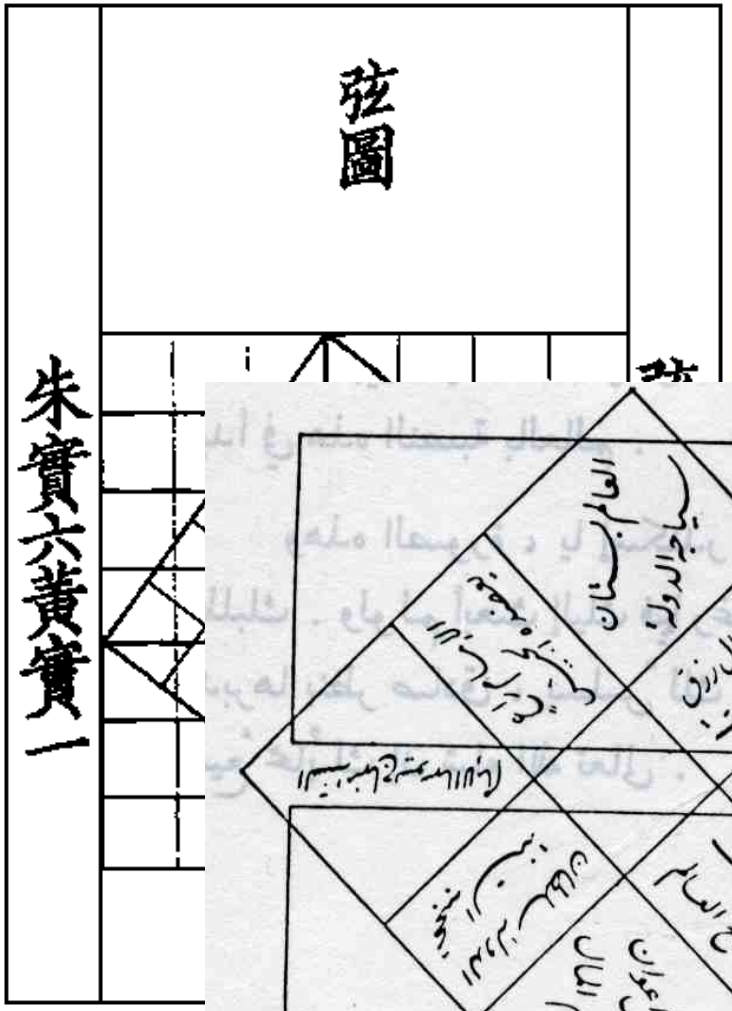
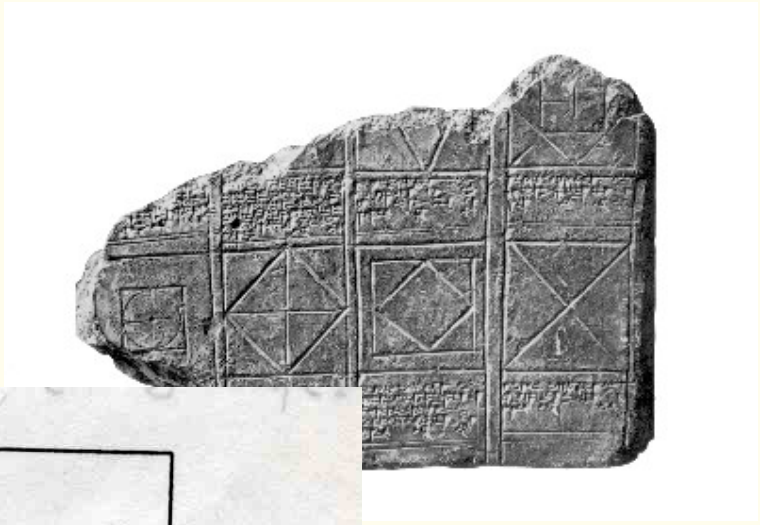
Pythagoras' result

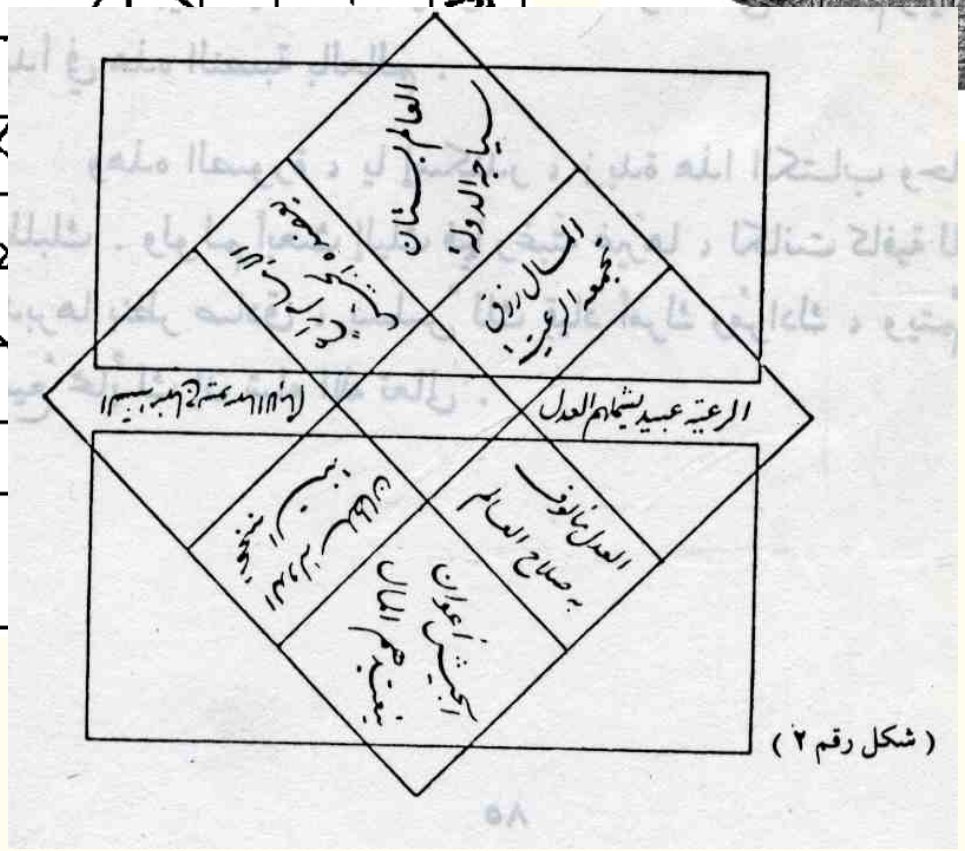
Sides in a right angled triangle


弦圖
弦實二十五朱及黃
朱實六黃實一

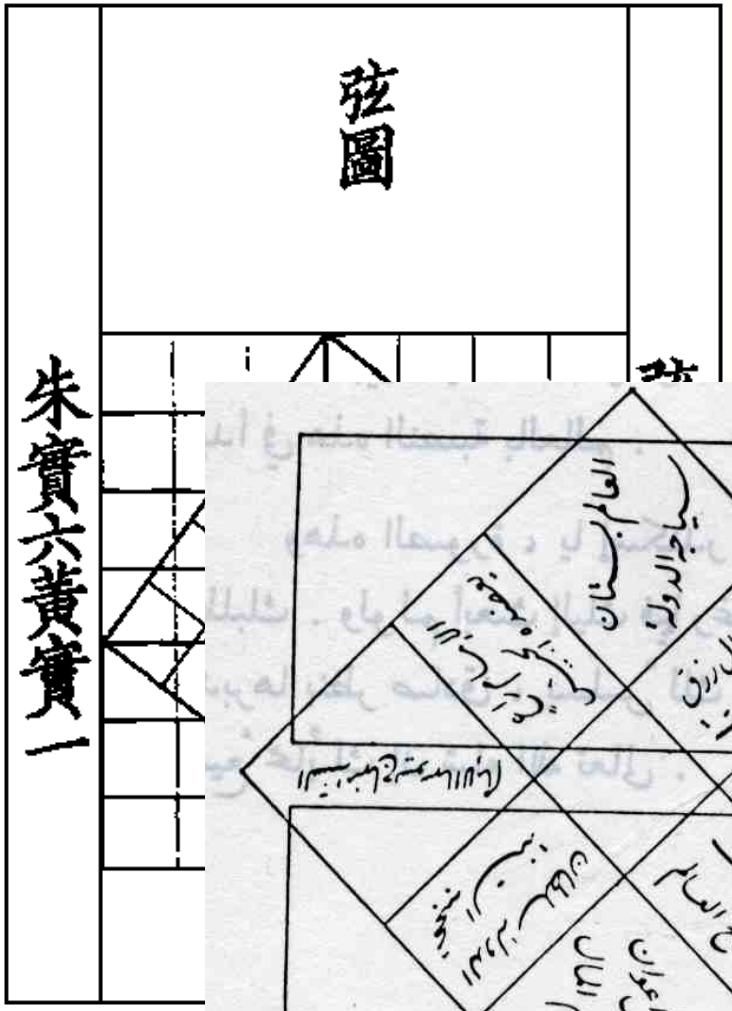


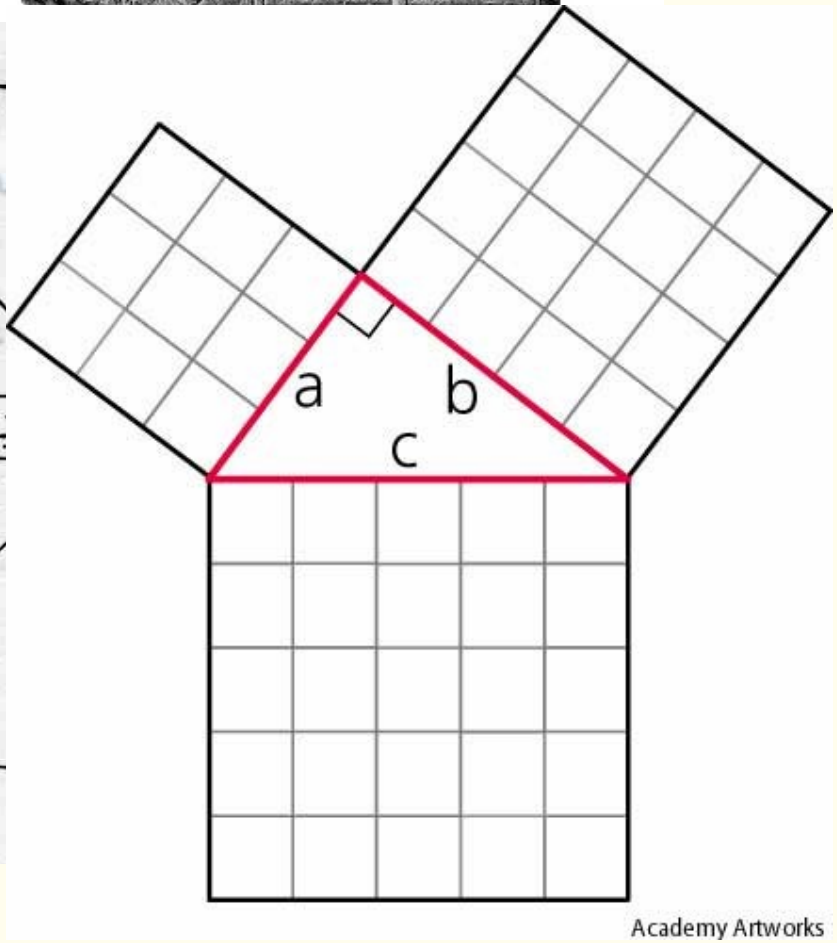

弦圖
朱實六黃實一




العالم بسنان
الرعية عبيد بنظام العدل
العدل بالوفا
بصلاح العالم

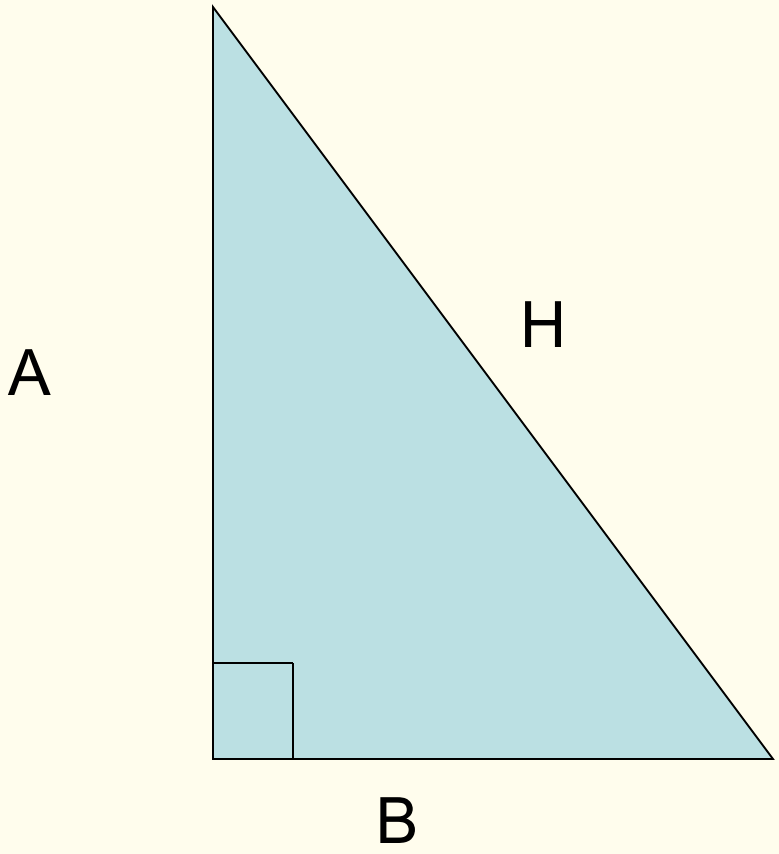
(شكل رقم ٢)


弦圖
朱實六黃實一

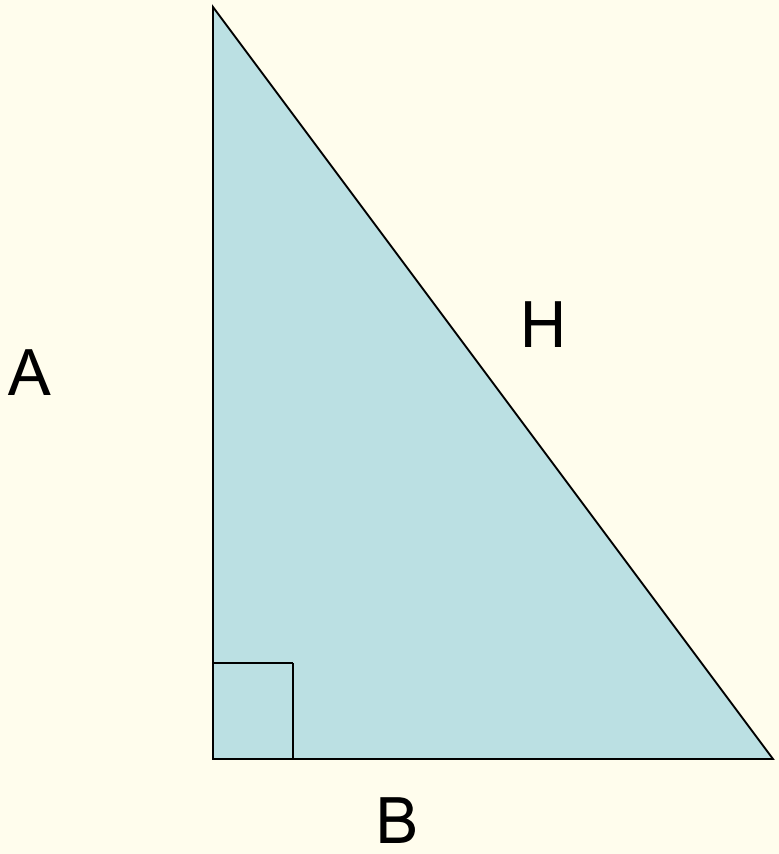

a
b
c
Academy Artworks

The result: long side

$$H^2 = A^2 + B^2$$



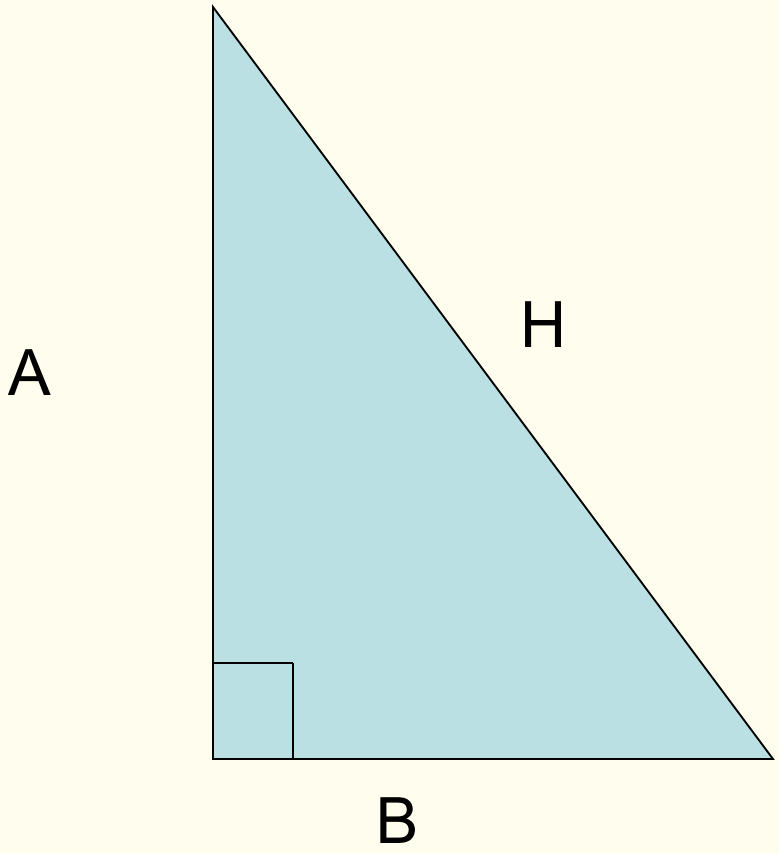
The result: long side



$H^2 = A^2 + B^2$

To find the length of the long side:

The result: long side

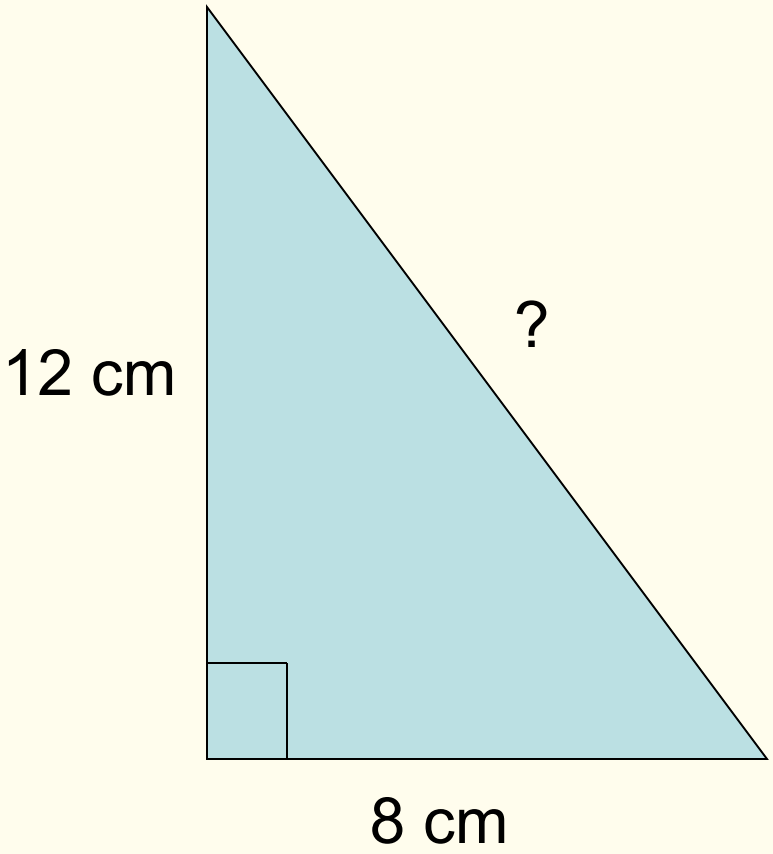


$H^2 = A^2 + B^2$

To find the length of the long side:

Find the squares of the two shortest sides, add the result, take the square root of the total…

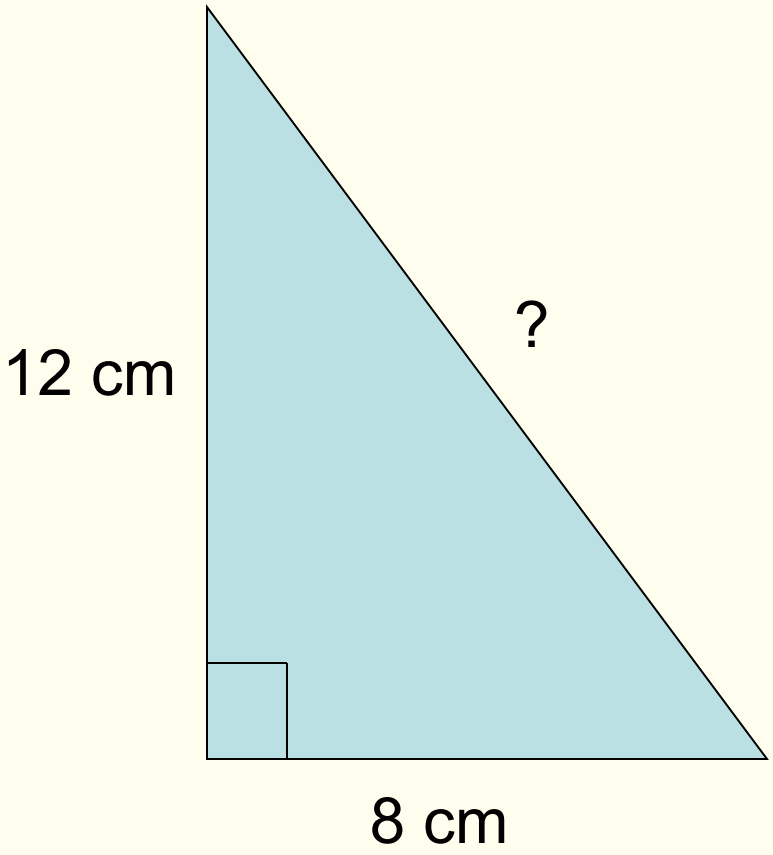
Example: long side



$H^2 = A^2 + B^2$

To find the length of the long side:

Example: long side



$H^2 = A^2 + B^2$

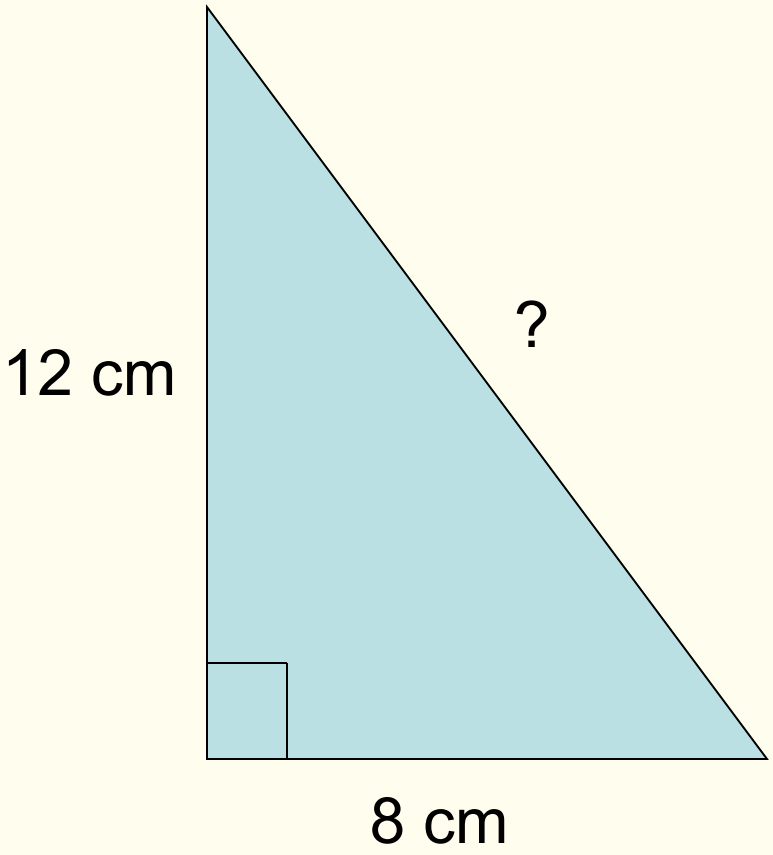
To find the length of the long side:

$12^2 = 144$

$8^2 = 64$

Square short sides

Example: long side



$H^2 = A^2 + B^2$

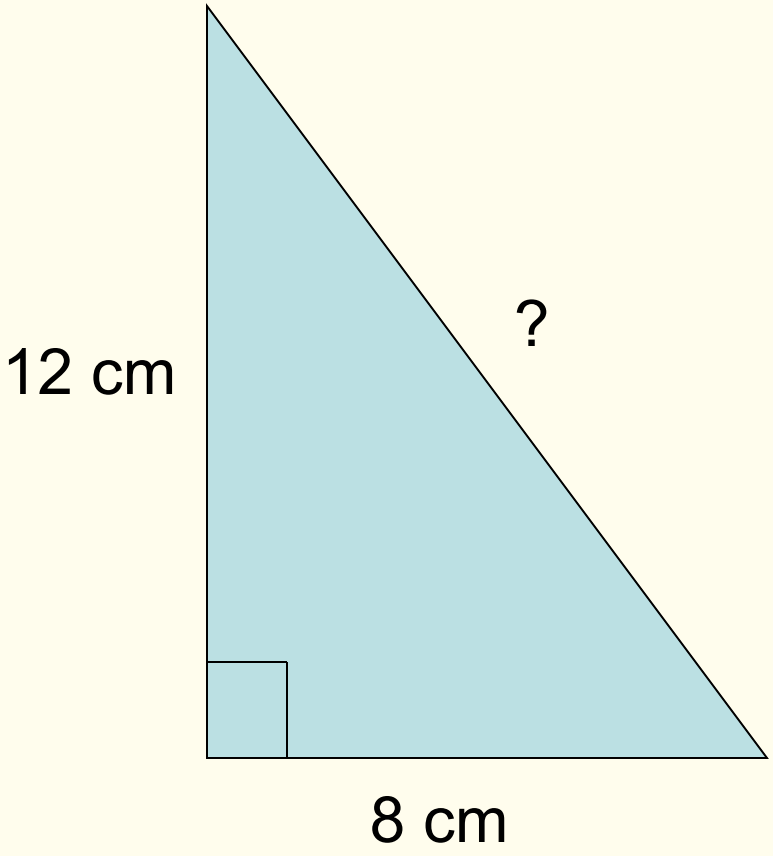
To find the length of the long side:

$12^2 = 144$ Square short sides

$8^2 = 64$

$144 + 64 = 208$ Add

Example: long side



$H^2 = A^2 + B^2$

To find the length of the long side:

$12^2 = 144$ Square short sides

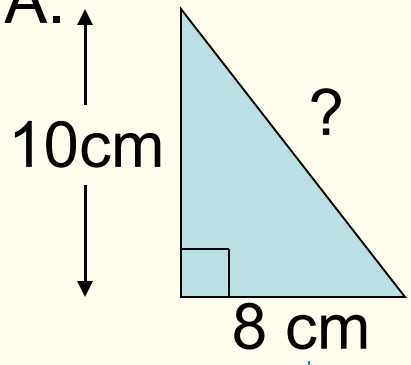
$8^2 = 64$

$144 + 64 = 208$ Add

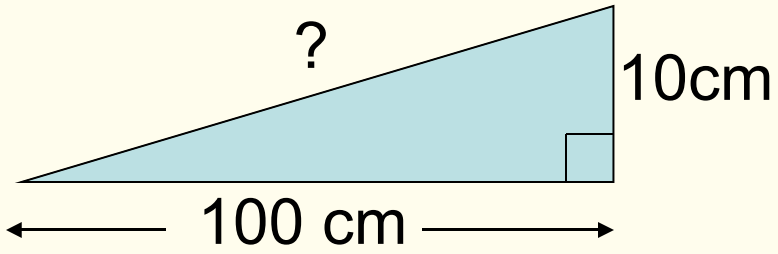
$\sqrt{208} = 14.4$ Square root

Your turn

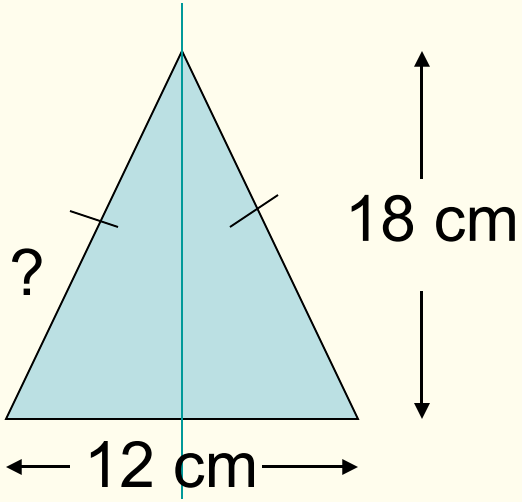
A.



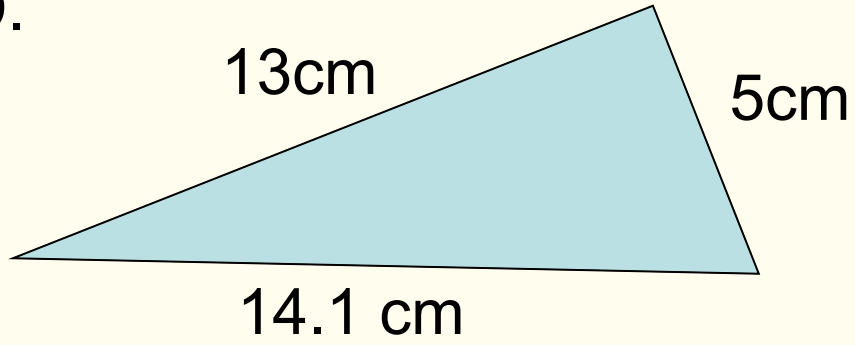
B.



C.



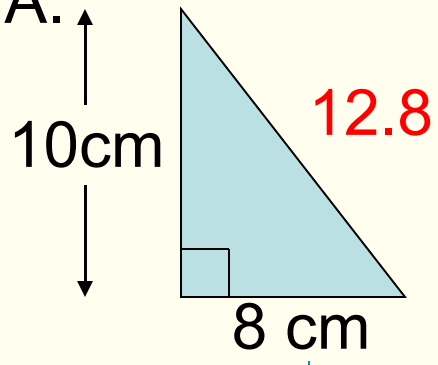
D.



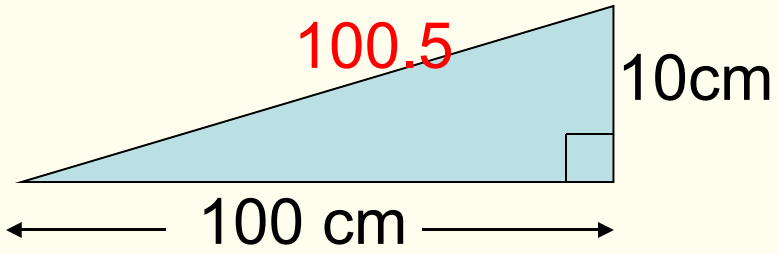
Is this triangle right angled?

Your turn: Answers

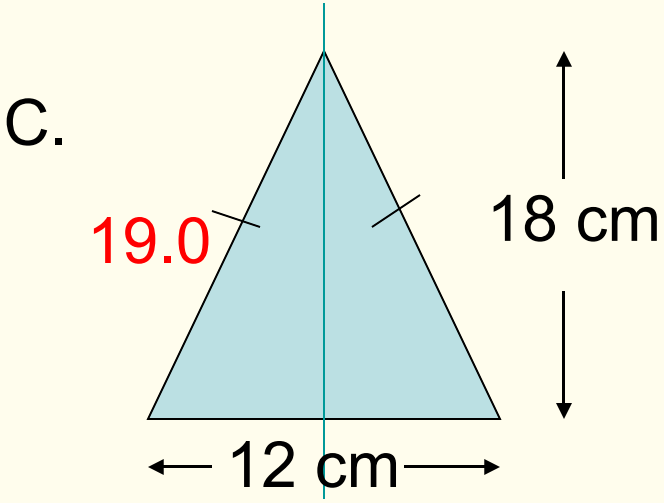
A.



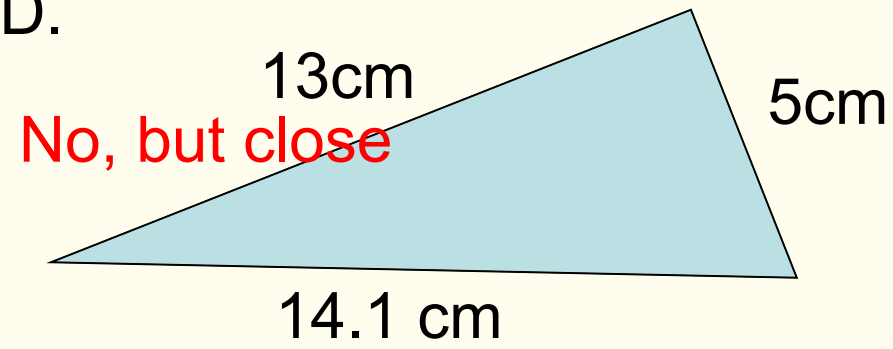
B.



C.

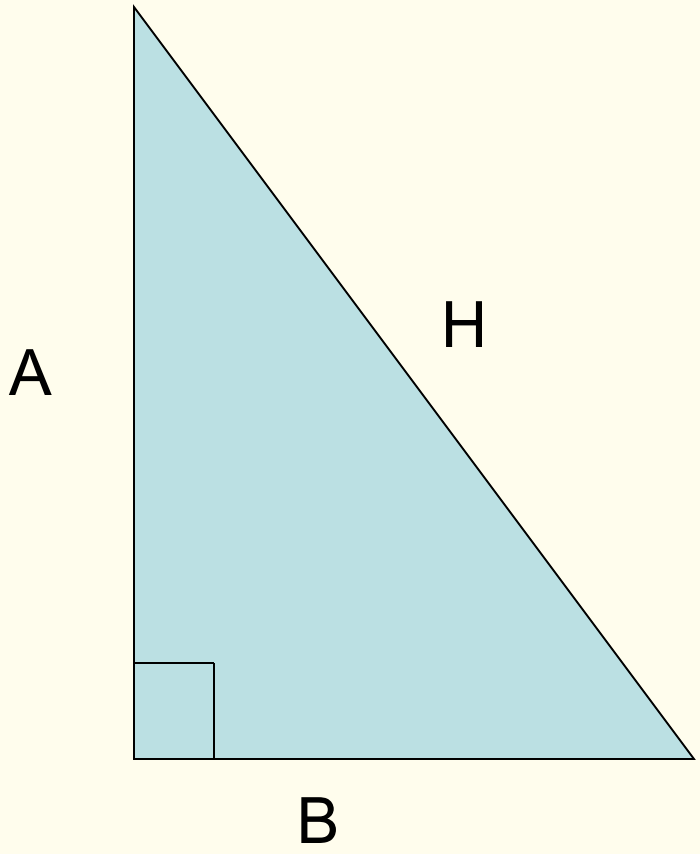


D.



Is this triangle right angled?

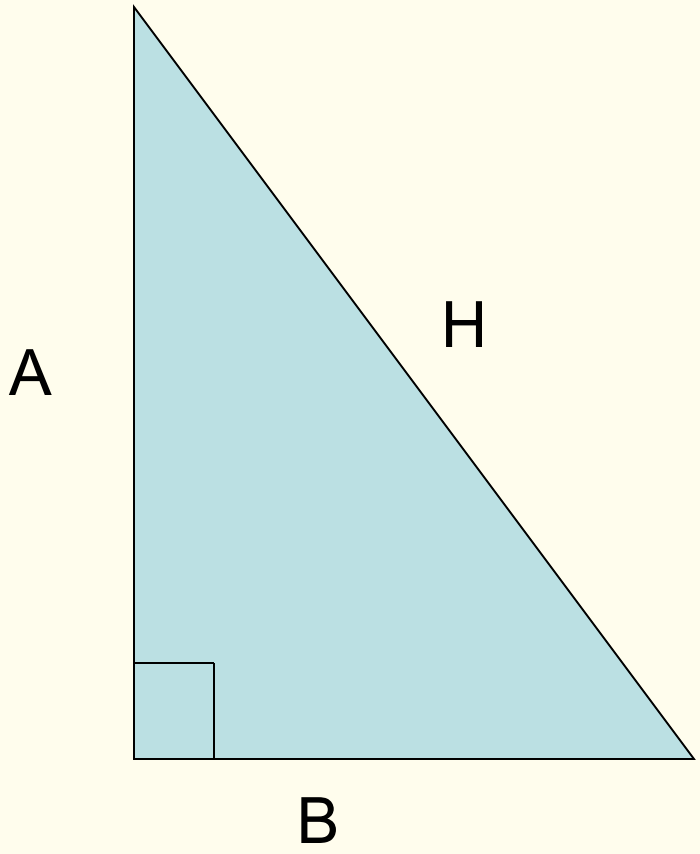
The result: short side



$A^2 = H^2 - B^2$

To find the length of the short side:

The result: short side



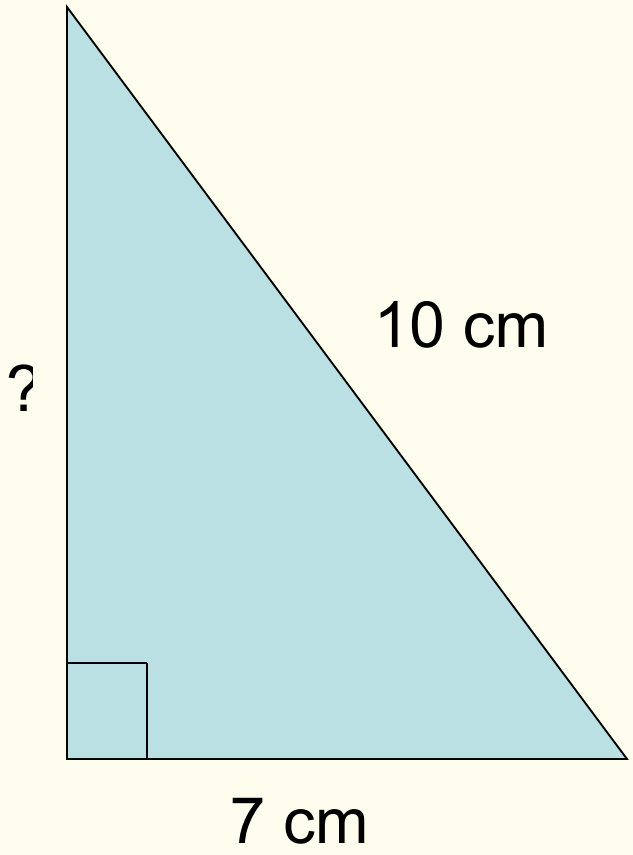
$A^2 = H^2 - B^2$

To find the length of the short side:

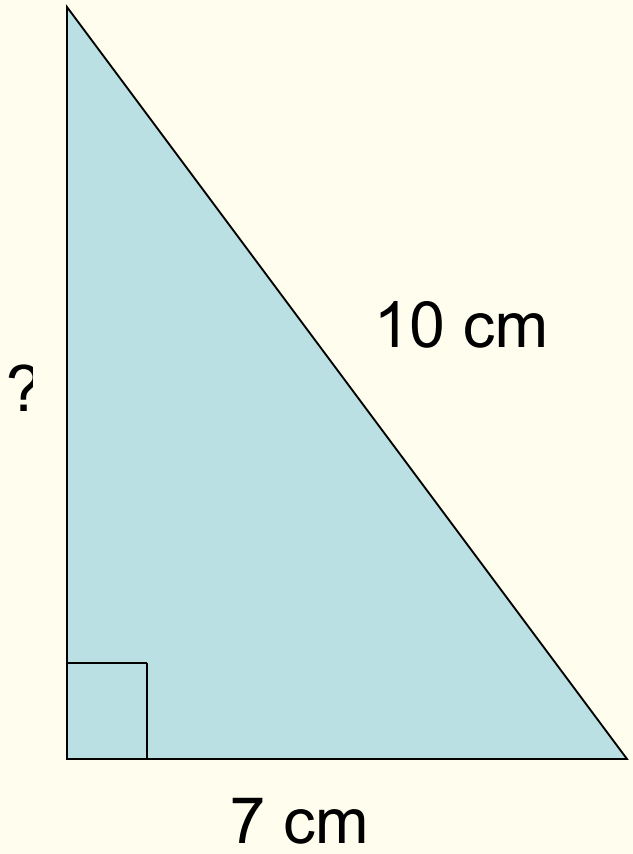
Find the squares of the long side and the other short side, find the difference, take the square root of the total…

Example: short side

$A^2 = H^2 - B^2$



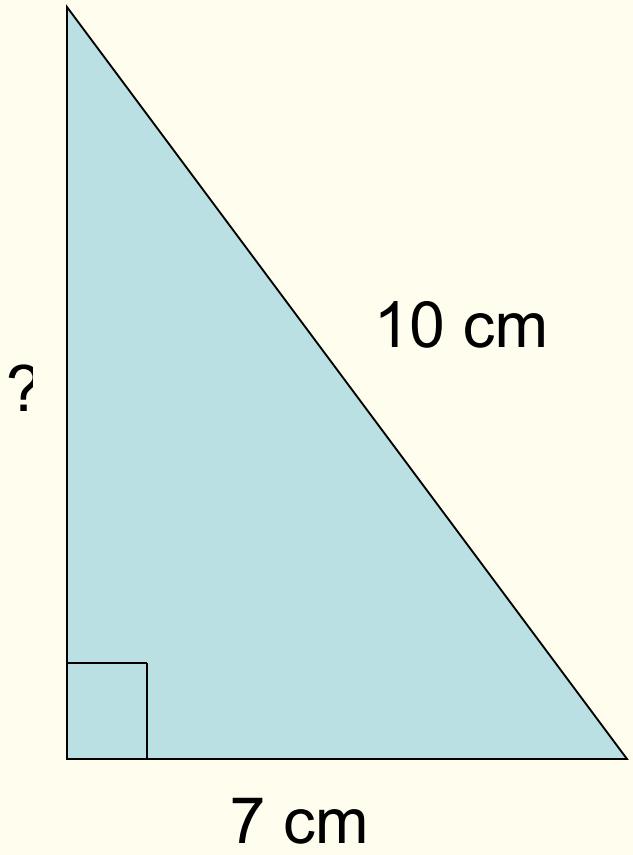
Example: short side



$A^2 = H^2 - B^2$

To find the length of the short side:

Example: short side



$A^2 = H^2 - B^2$

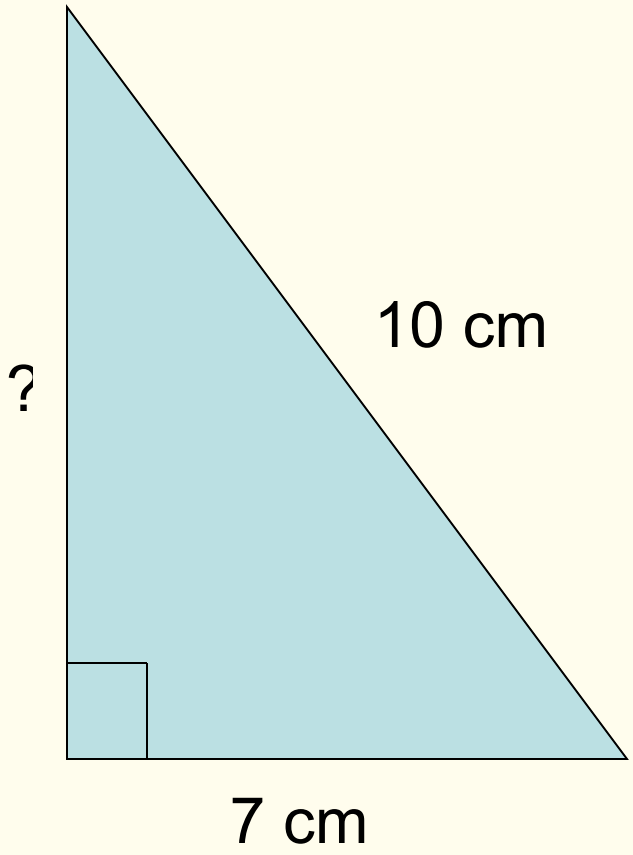
To find the length of the short side:

$10^2 = 100$

$7^2 = 49$

Square known sides

Example: short side



$A^2 = H^2 - B^2$

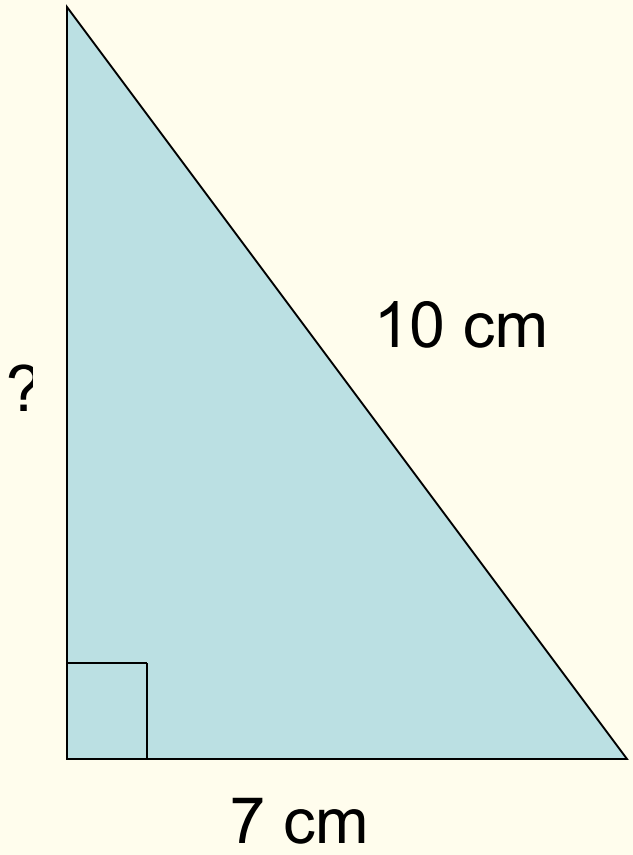
To find the length of the short side:

$10^2 = 100$ Square known sides

$7^2 = 49$

$100 - 49 = 51$ Subtract

Example: short side



$A^2 = H^2 - B^2$

To find the length of the short side:

$10^2 = 100$ Square known sides

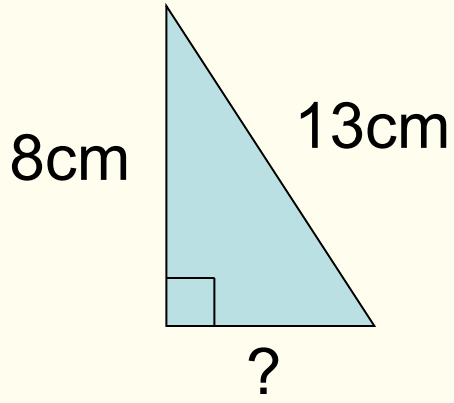
$7^2 = 49$

$100 - 49 = 51$ Subtract

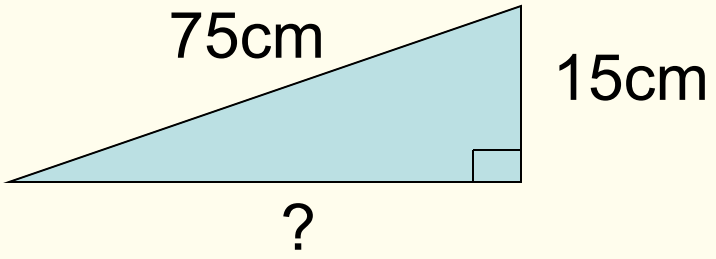
$\sqrt{51} = 7.14$ cm Square root

Your turn

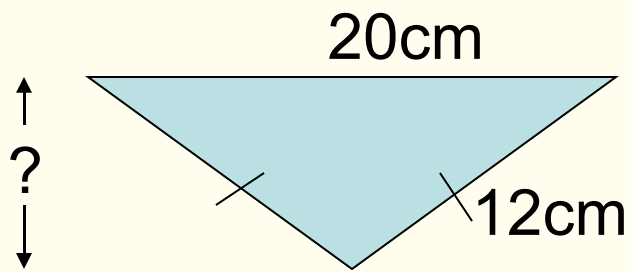
A.



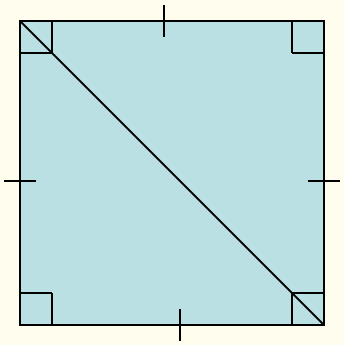
B.



C.



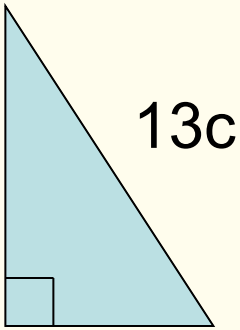
D.



Diagonal is 14.1 cm long
How long is side?

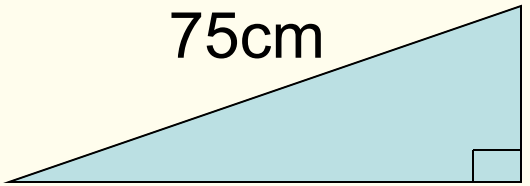
Your turn: answers

A.



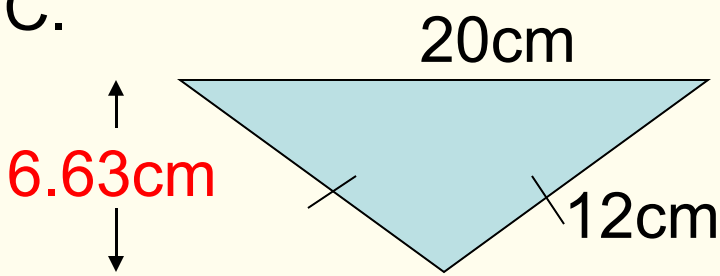
10.2cm

B.

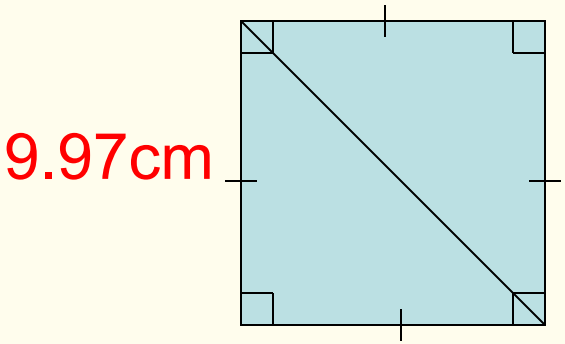


73.5cm

C.

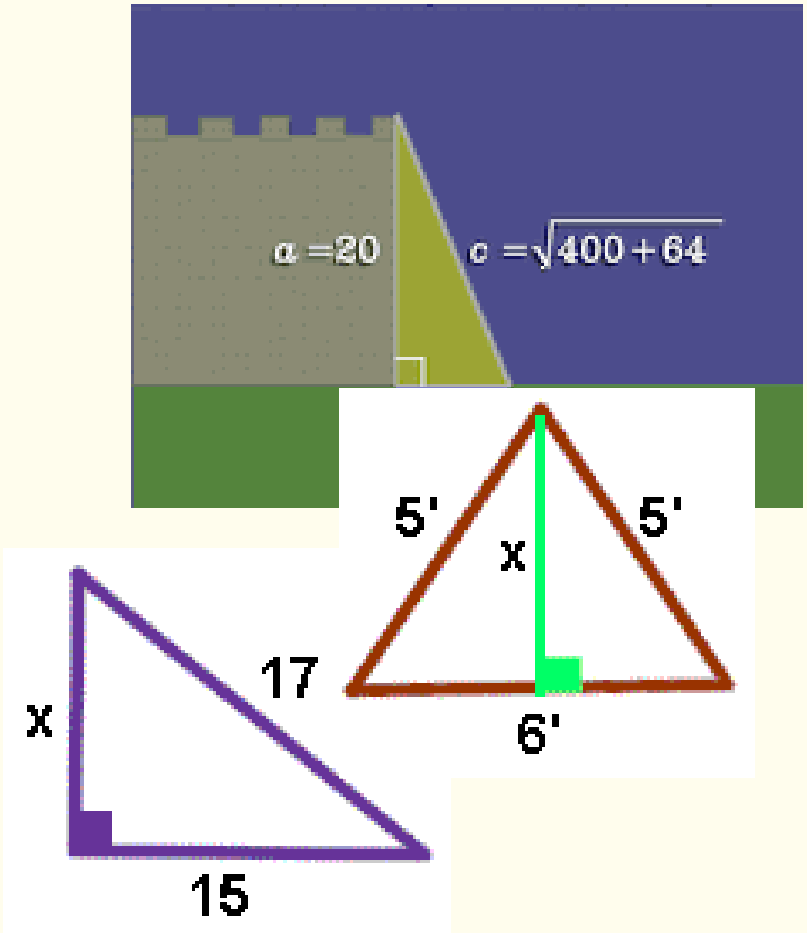


D.



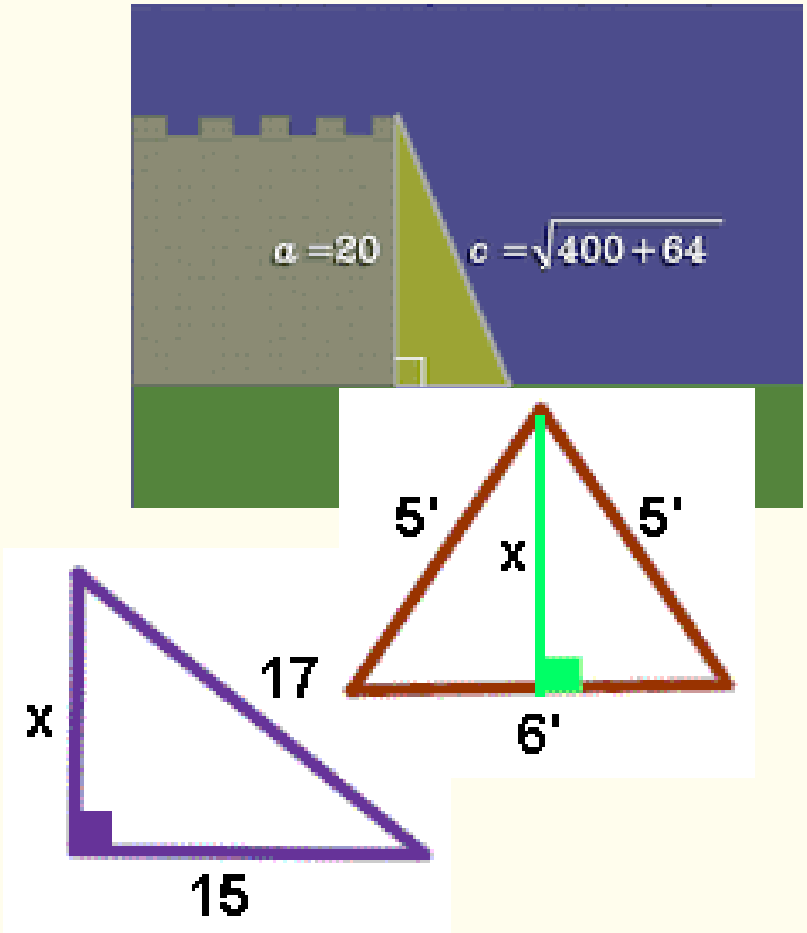
Diagonal is 14.1 cm long
How long is side?

Mixed problems



Mixed problems

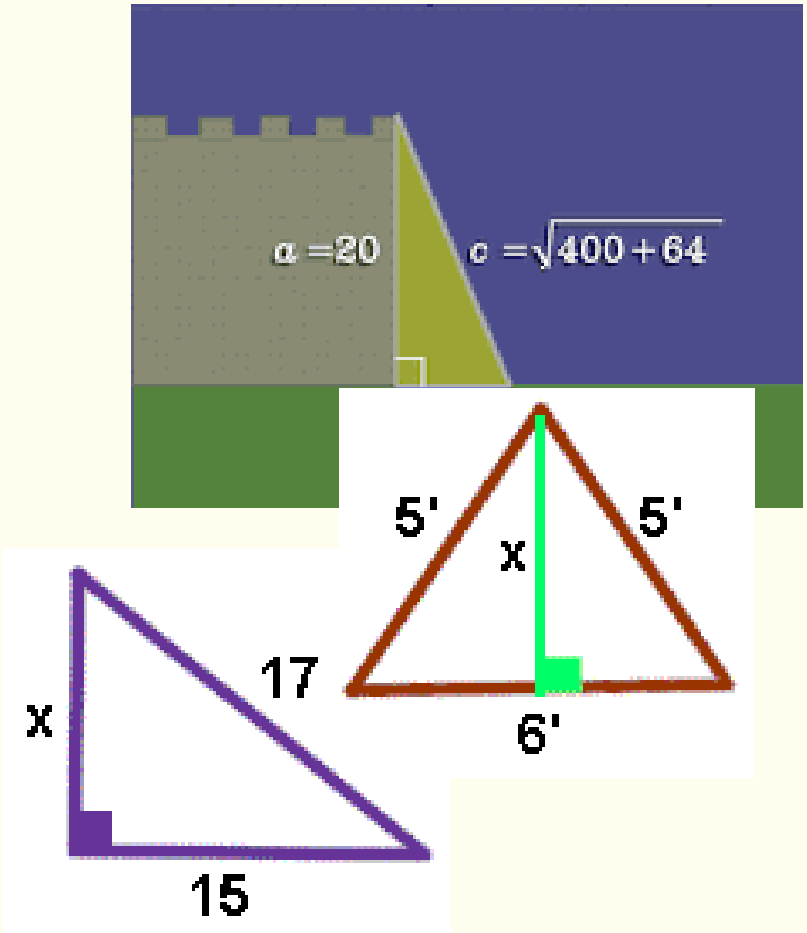
Find the right angle



Mixed problems

Find the right angle

Opposite side is always longest

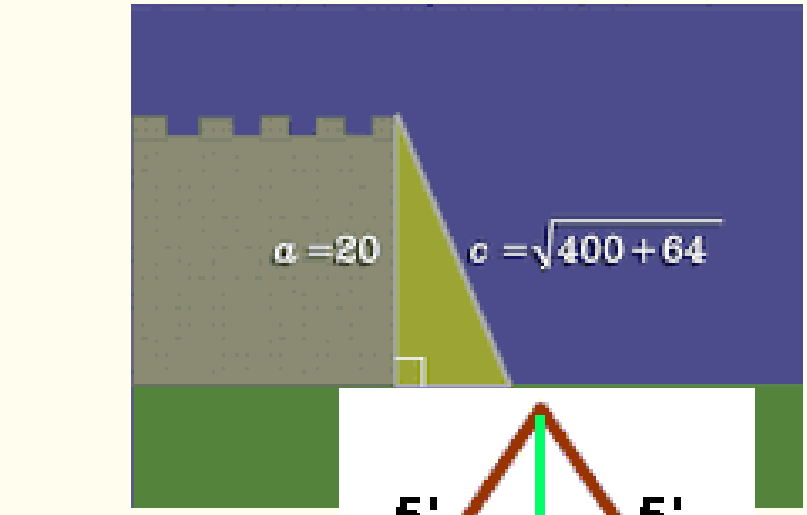


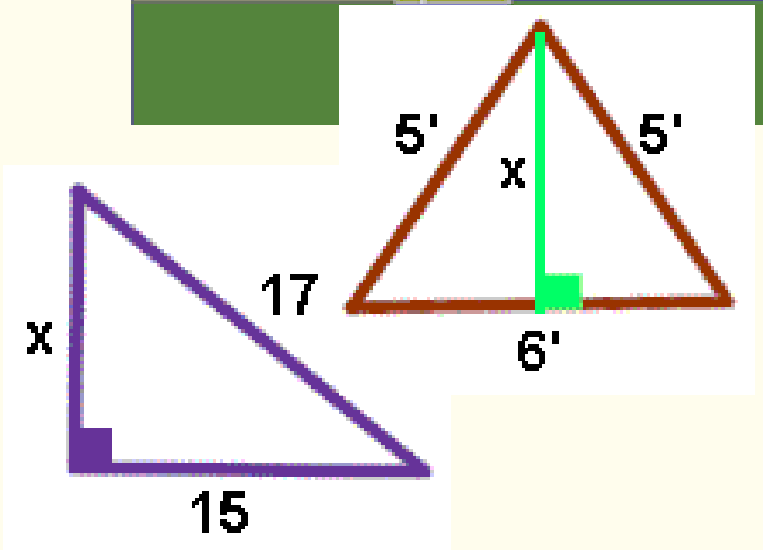
Mixed problems

Find the right angle

Opposite side is always longest

If you know both short sides: square and add





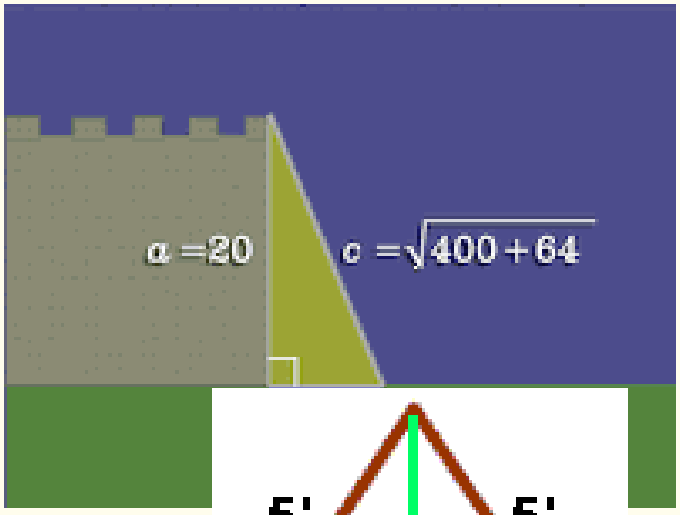
Mixed problems

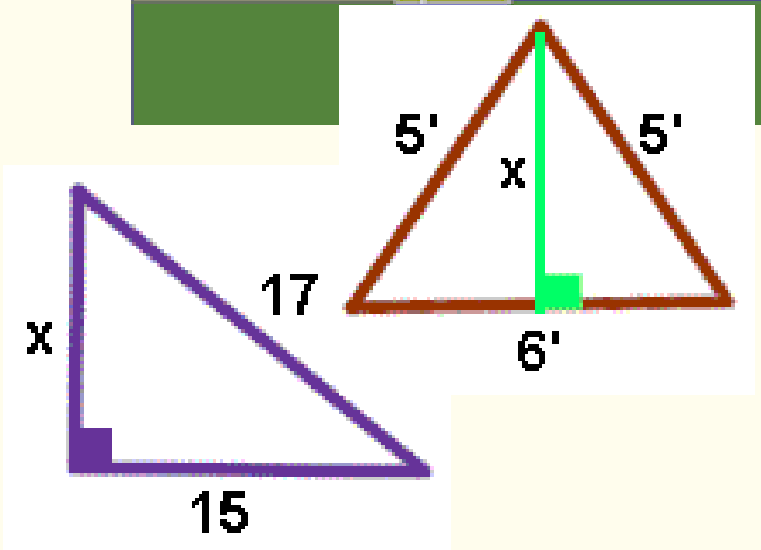
Find the right angle

Opposite side is always longest

If you know both short sides: square and add

If you know a long and a short side: square and subtract





Mixed problems

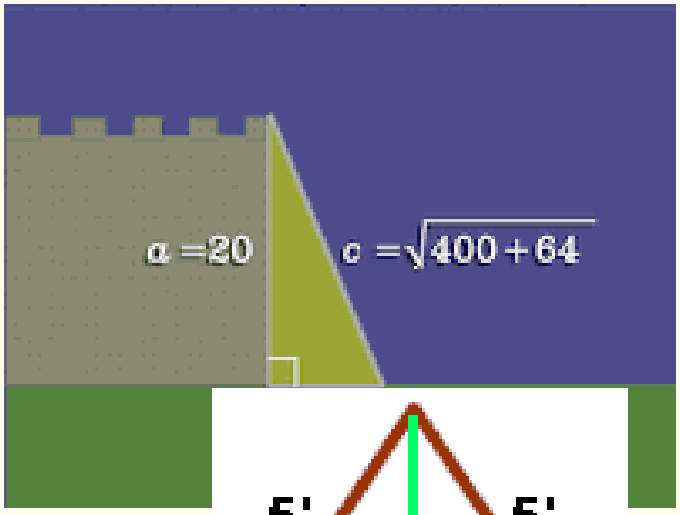
Find the right angle

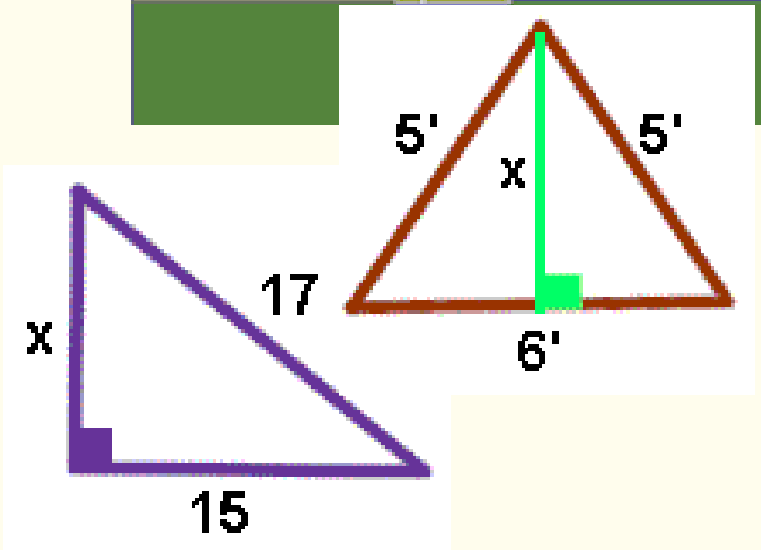
Opposite side is always longest

If you know both short sides: square and add

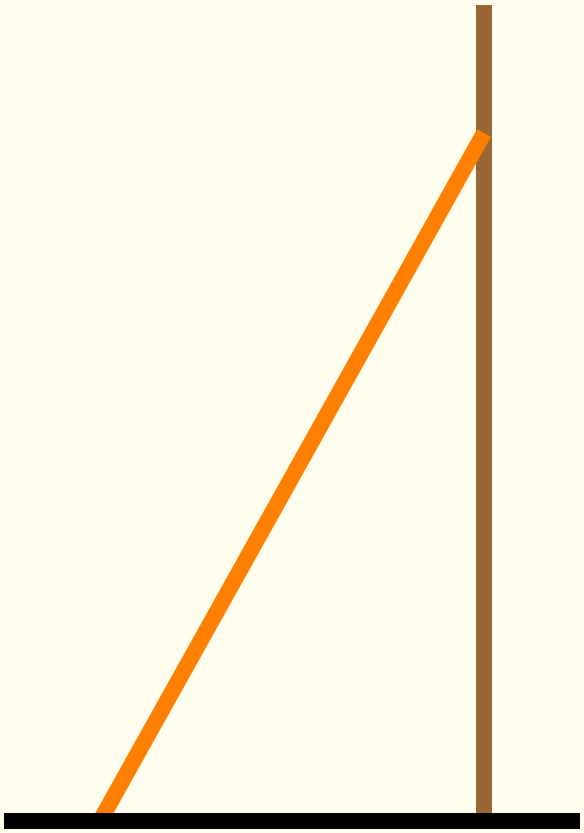
If you know a long and a short side: square and subtract

Take square root at the end…





Example

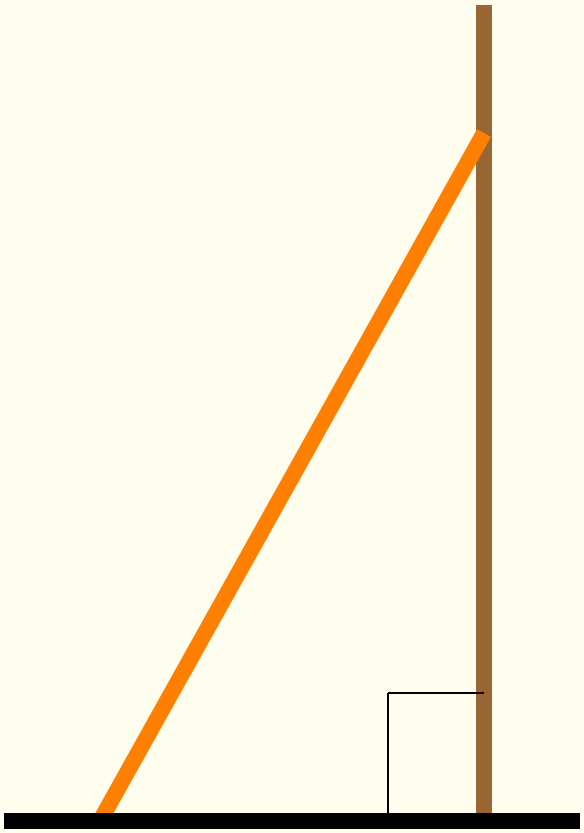


A ladder leans against a wall.

The ladder is 15ft long, and the foot of the ladder is placed 3 ft away from the wall.

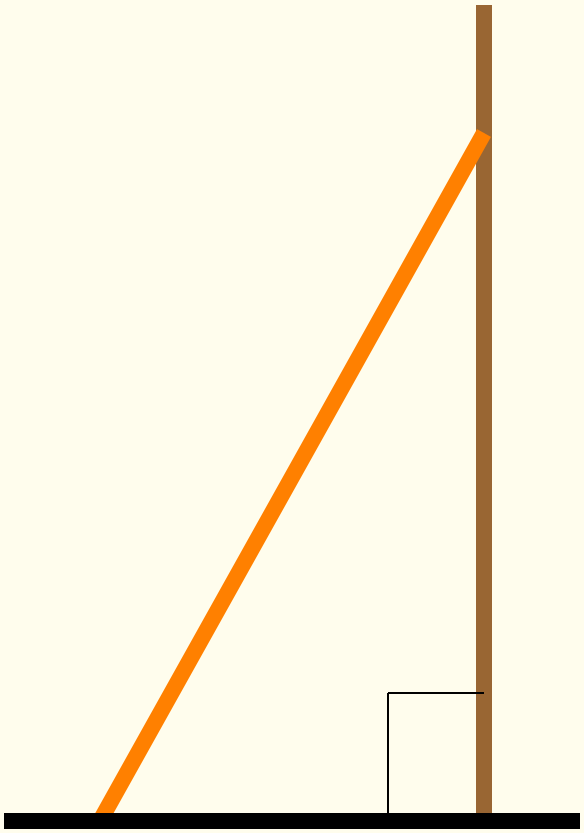
How high up the wall does the ladder reach?

Example



Right angle is assumed to be between wall and ground!

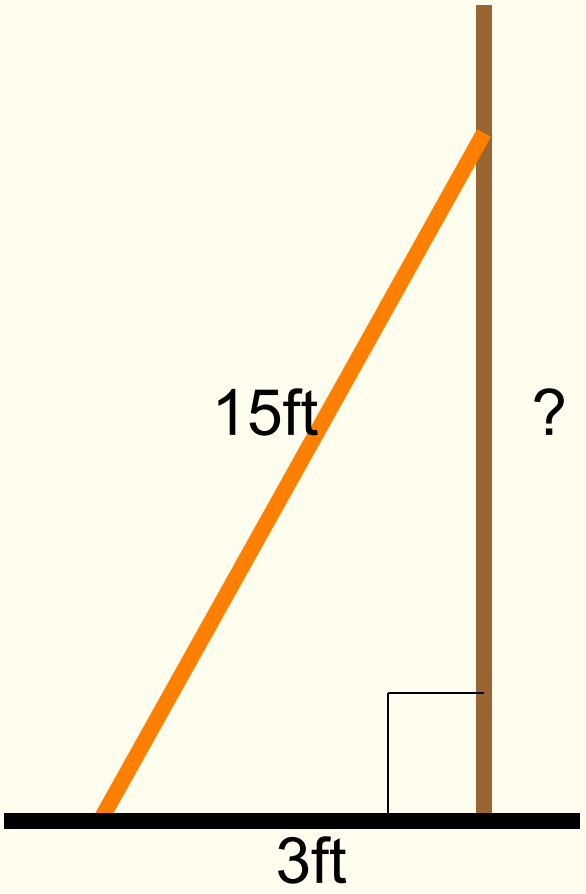
Example



Right angle is assumed to be between wall and ground!

The 15ft ladder is the longest side

Example

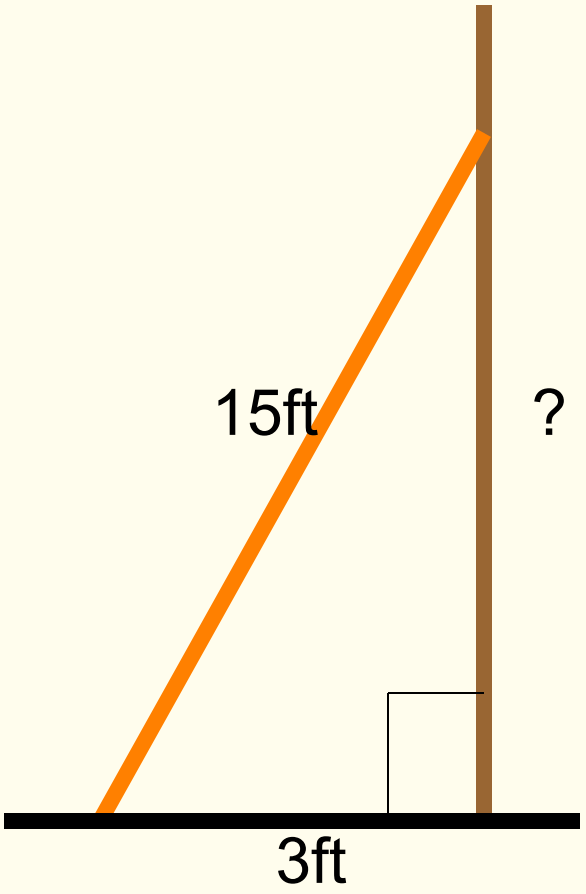


Right angle is assumed to be between wall and ground!

The 15ft ladder is the longest side

The height up the wall is the missing short side

Example



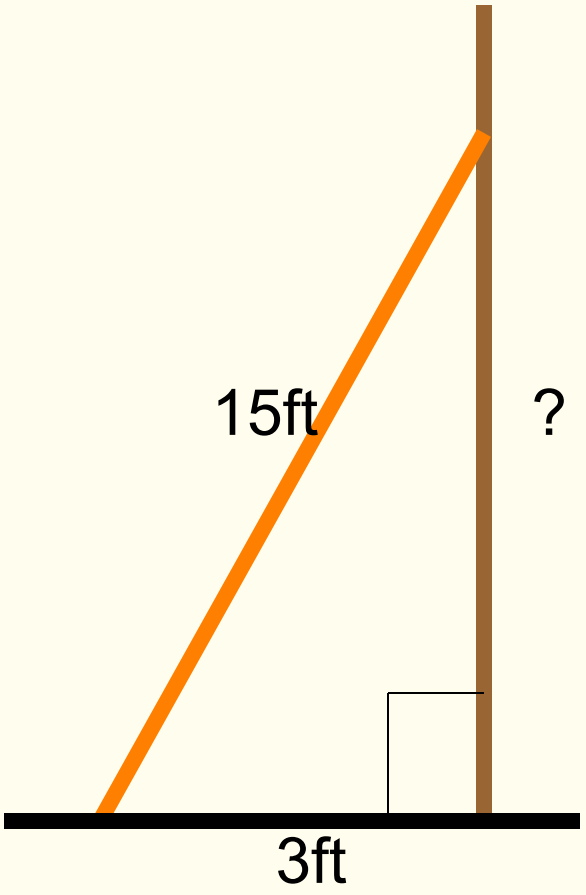
Right angle is assumed to be between wall and ground!

The 15ft ladder is the longest side

The height up the wall is the missing short side

$15^2 - 3^2 = 225 - 9 = 216$

Example



Right angle is assumed to be between wall and ground!

The 15ft ladder is the longest side

The height up the wall is the missing short side

$15^2 - 3^2 = 225 - 9 = 216$

$\sqrt{216} = 14.7$ ft

Your turn

- Find the mixed exercises in your textbook
- Make sure you know where the right angle is
- Check that your answers make sense (the longest side must always be less than the sum of the two short sides!)