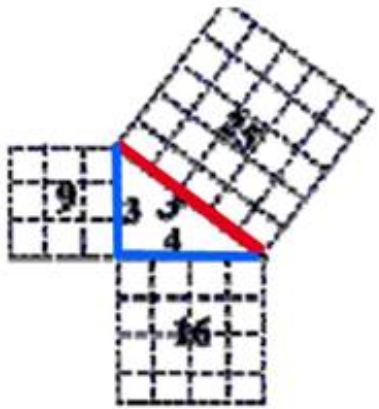
* Grade 10 Review *

Pythagorean Theorem

The Magic of the Right Triangle



MrF

FUNDAMENTAL

MUST KNOW!

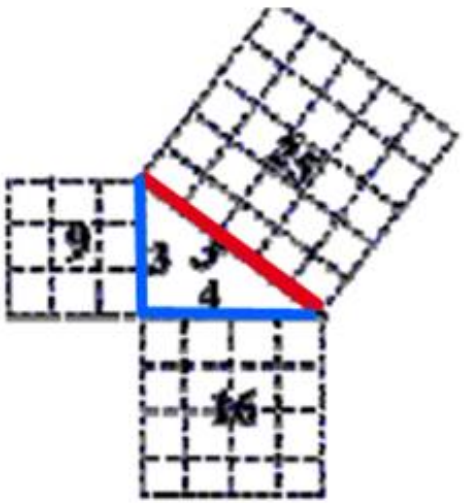
CRITICAL

2500 years ago!

A teacher
Maybe even a gangster

Known for several things but foremost is the Pythagorean Theorem

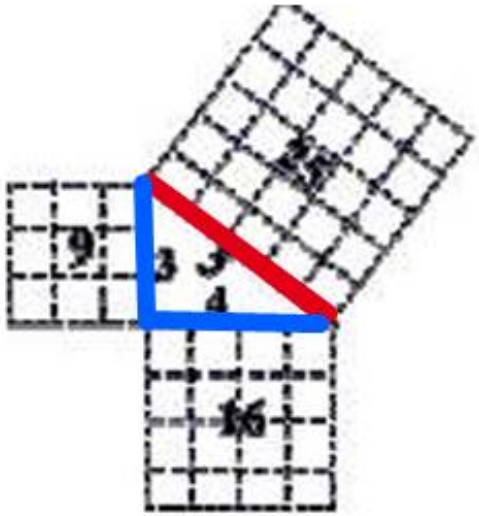
"Law"



There it is!!!!

End of Lesson.

"The sum of the squares on the two short sides of a right triangle equals the square on the long side"



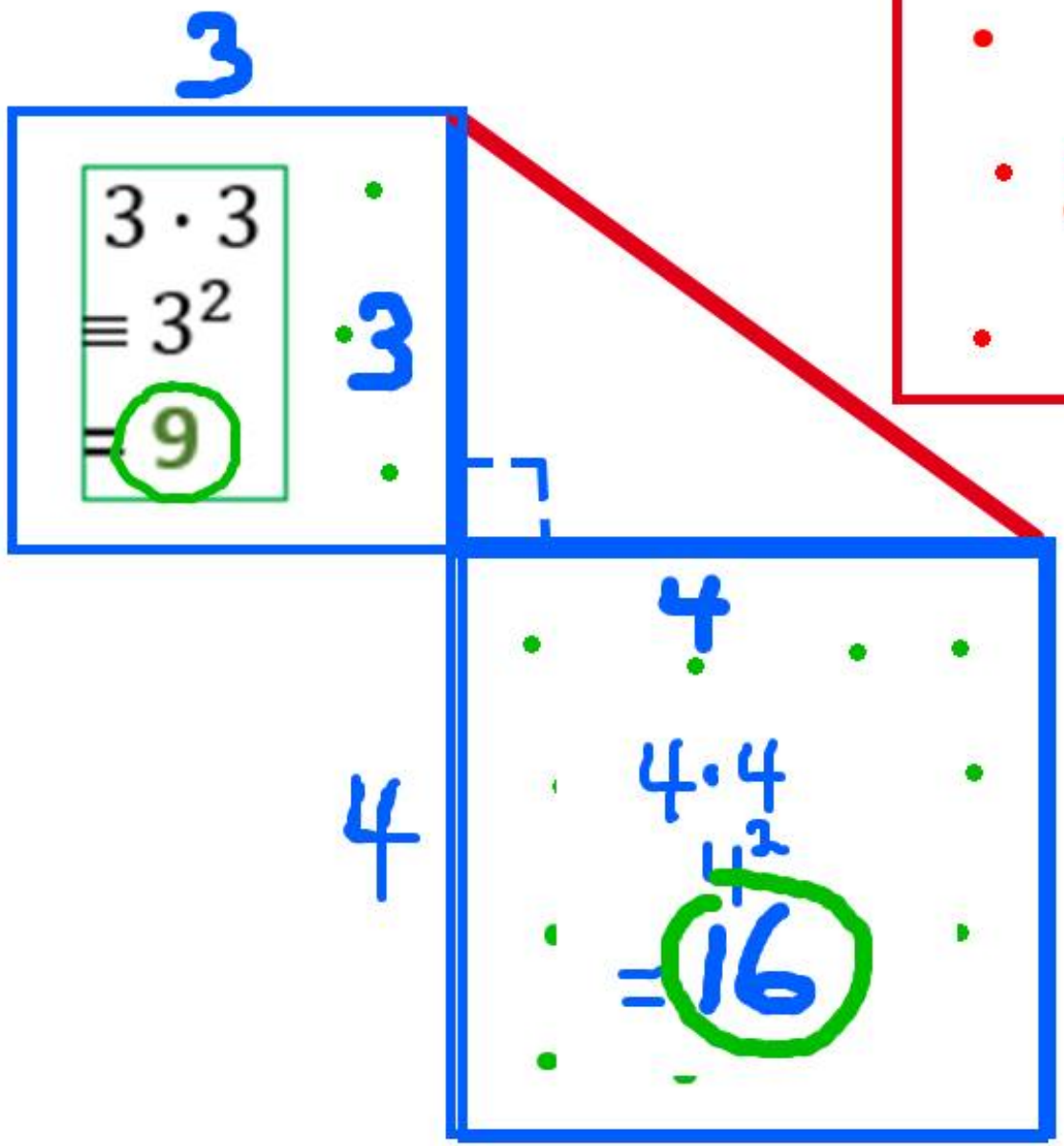
↑

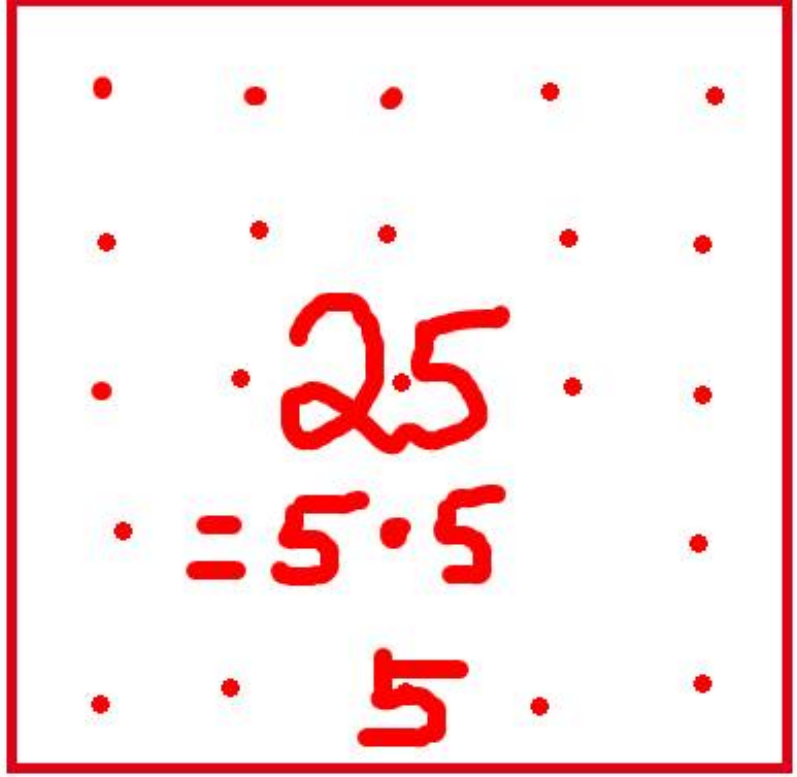
Say this 10 times out loud!

Write it out 10 times

Not joking! Do it!

A Right Triangle has a 90 degree square corner





16
+ 9
= 25

"The sum of the squares on the two short sides of a right triangle equals the square on the long side"

That is it!!!!

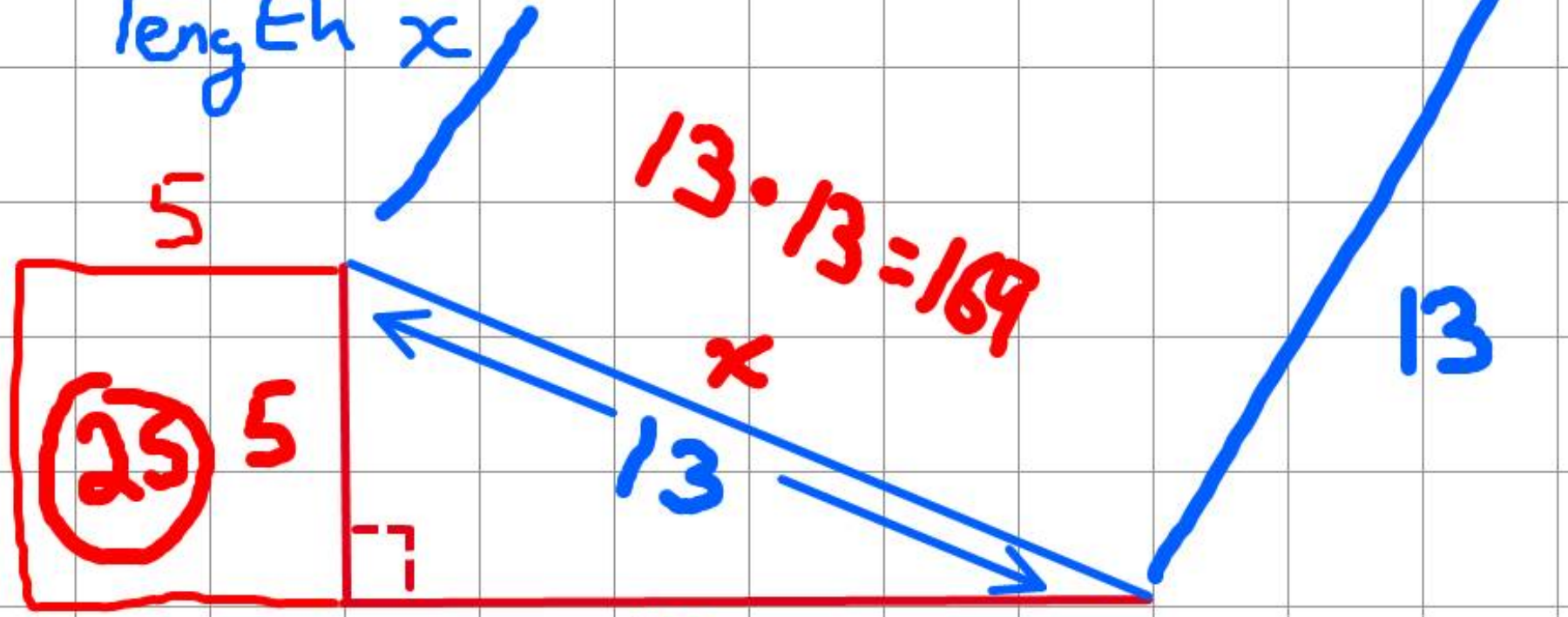
"The sum of the squares on the two short sides of a right triangle equals the square on the long side"

Why are you still here???

Examples?

Try this then!

determine length x



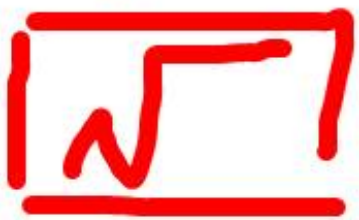
12 · 12 = 144

$12^2 = 144$

144 + 25 = 169

How did we know that $13 \cdot 13$, that is 13^2, equals 169?

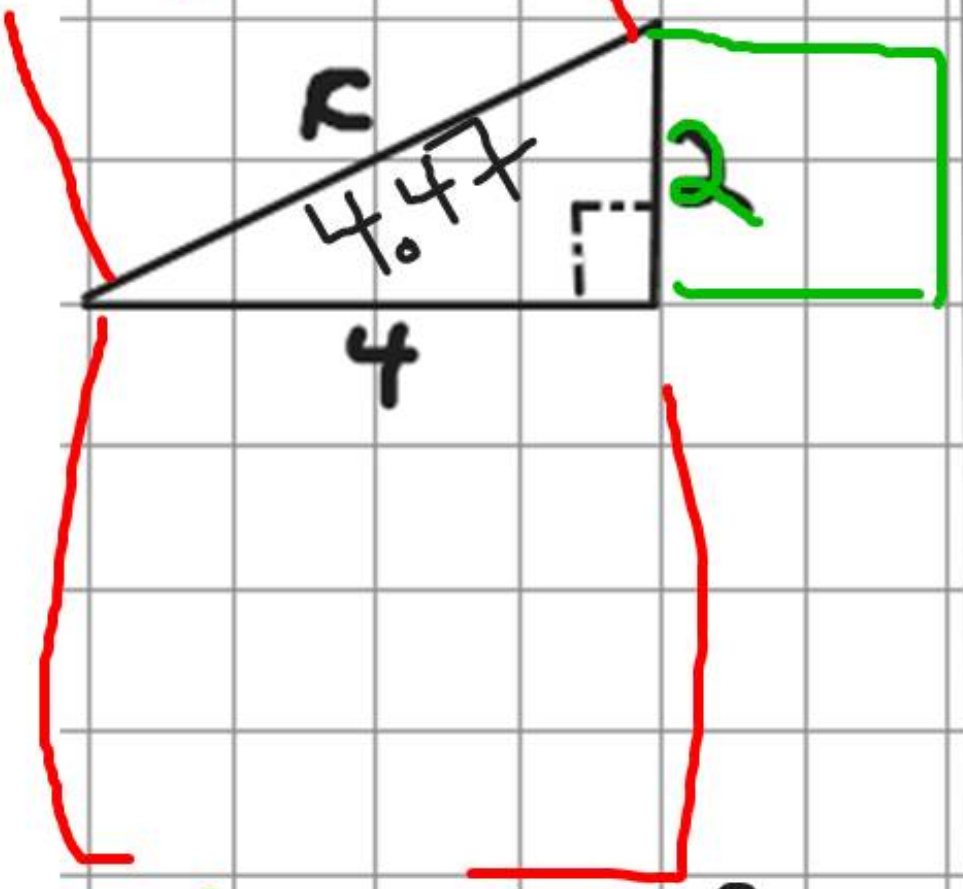
We unsquared!



button on your calculator

Try these two

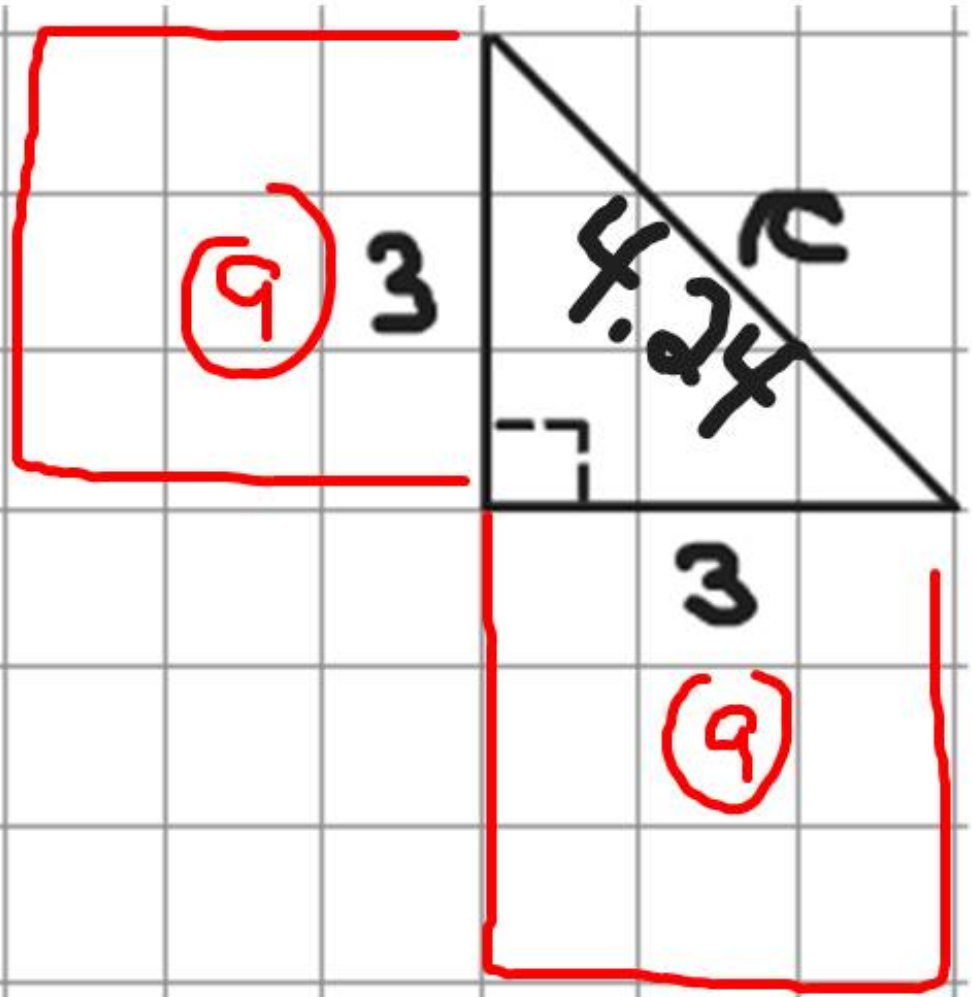
c^2



$2^2 + 4^2 = c^2$

$4 + 16 = c^2$

$20 = c^2$; $c = \sqrt{20} \approx 4.47$

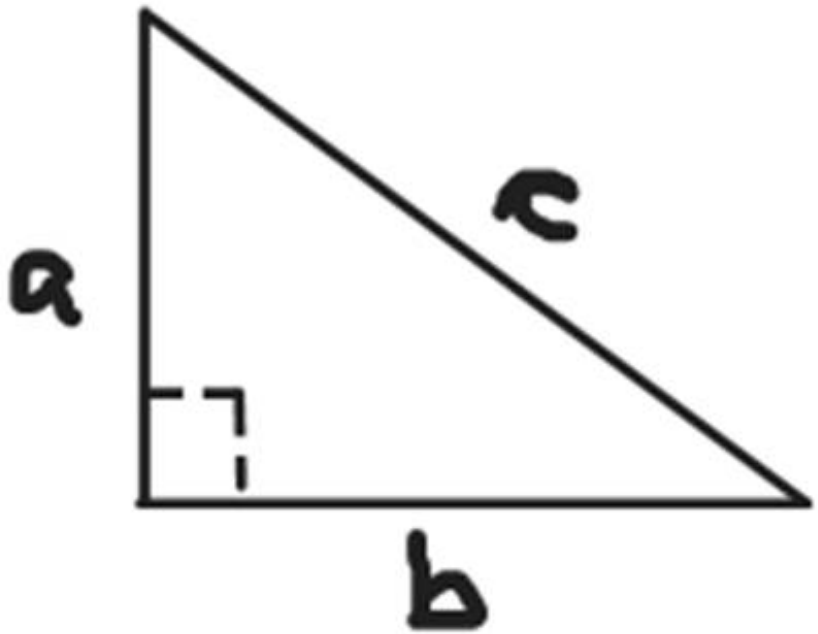


$3^2 + 3^2 = c^2$

$18 = c^2$

$c = \sqrt{18} \approx 4.24$

After a while you quit sketching all the squares on the edges of the triangle and just use a secret formula that represents the idea in symbols



BTW: the long side is called "hypotenuse"

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

the square of the long side

The sum of the squares of the two short sides

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

the square of the long side

The sum of the squares of the two short sides

"The sum of the squares on the two short sides of a right triangle equals the square on the long side"

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

the square of the long side

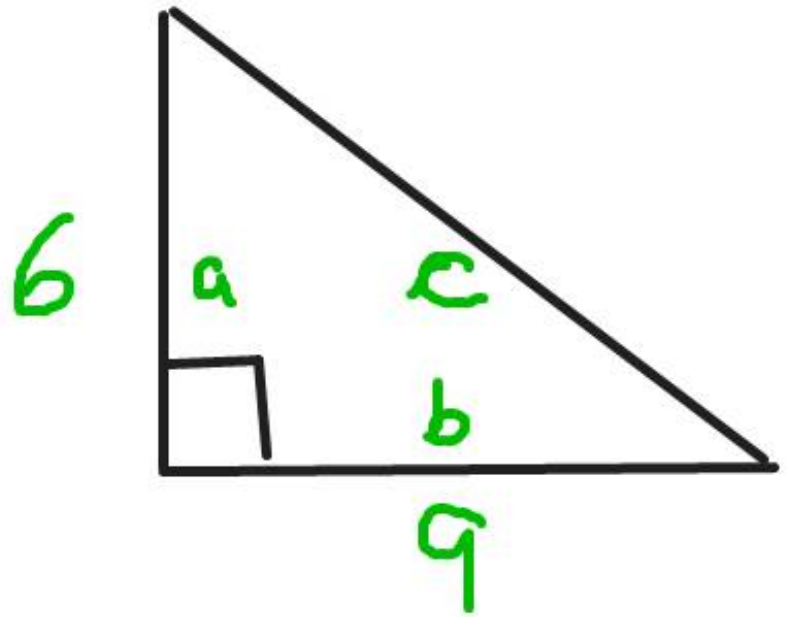
The sum of the squares of the two short sides

"The sum of the squares on the two short sides of a right triangle equals the square on the long side"

Say it 20 times
Write it 20 times

ONE MORE

Pause & do



$c^2 = 6^2 + 9^2$

$c^2 = 36 + 81$

$c^2 = 117$

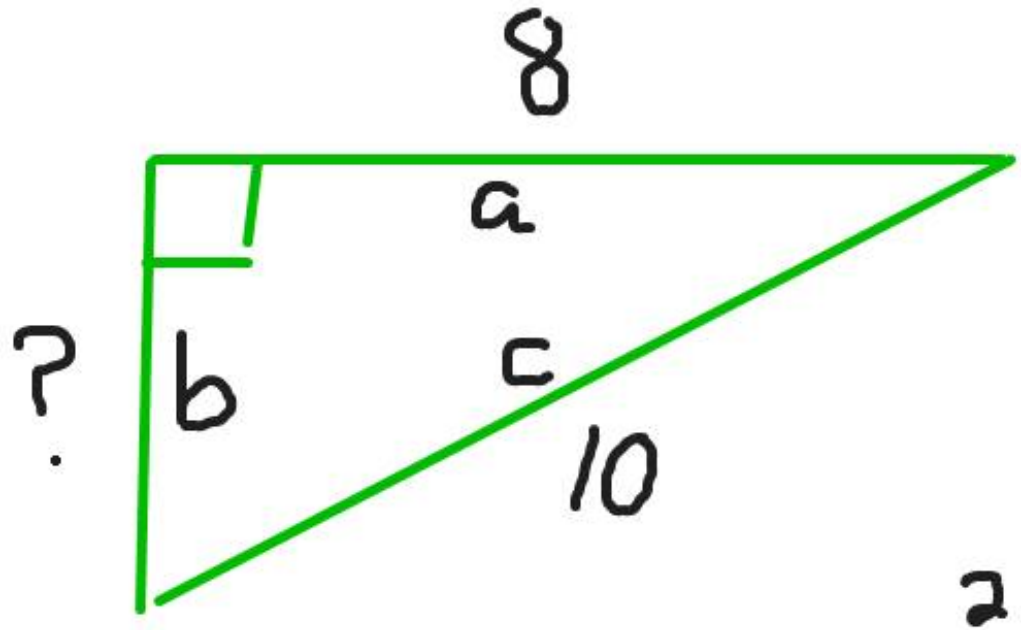
$c = \sqrt{117}$

$c \approx \sqrt{(117)}$

10.81665383

$c \approx 10.82$ units long

One Last thing to think about!!



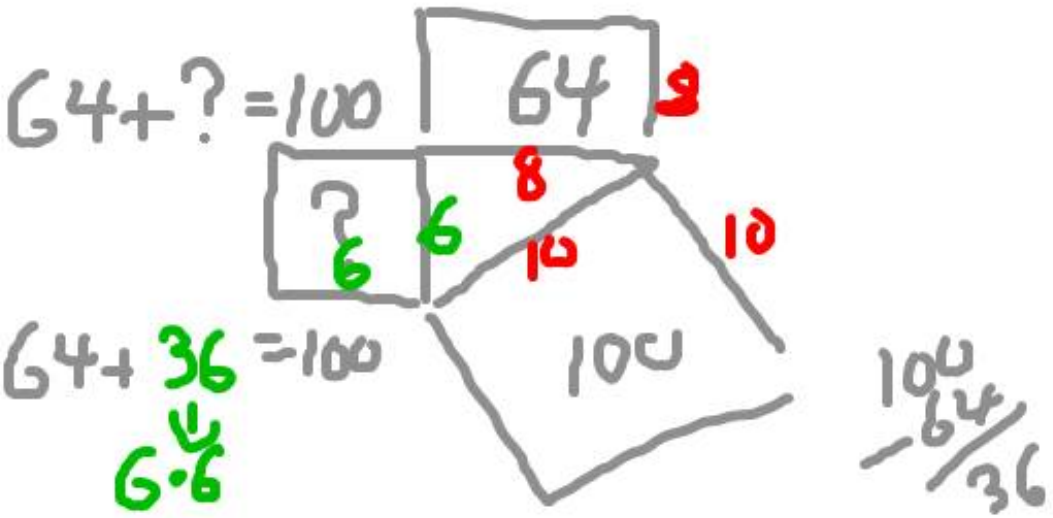
How long is side b? The law still works

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

$10^2 = 8^2 + b^2$

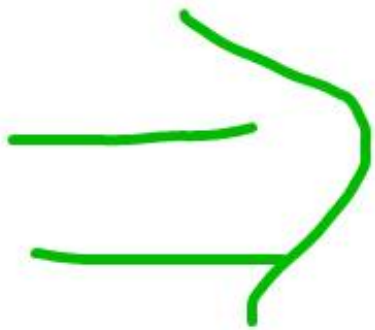
$100 = 64 + b^2$

$36 = b^2$; $b = 6$



Tons more practice

If all the other links and worksheets are still insufficient

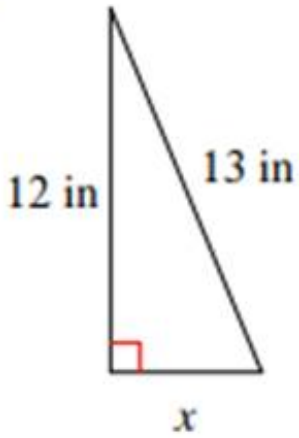


Find the missing side of each triangle. Round your answers to the nearest tenth if necessary.

A few to practice

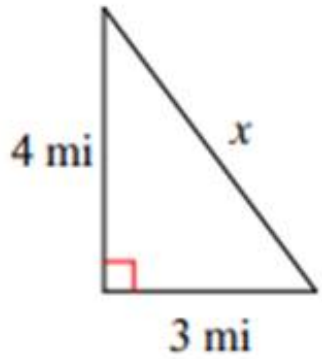
Pause and Do

1)



5 in

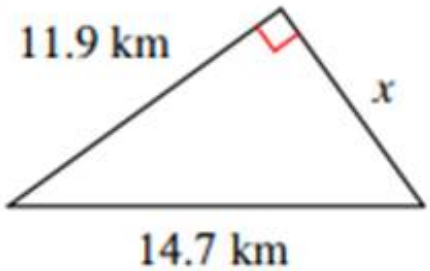
2)



5 mi

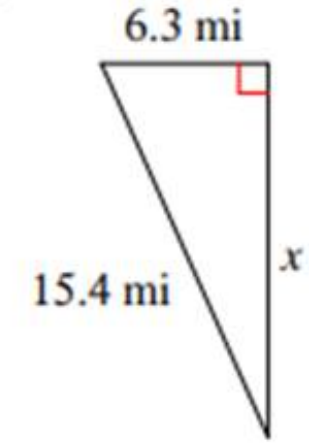
← answers

3)



8.6 km

4)



14.1 mi

Pause and Do

1. If $a = 6$ and $b = 8$, then $c =$ 10.

2. If $a = 7$ and $b = 24$, then $c =$ 25.

3. If $a = 5$ and $b = 7$, then $c \doteq$ 8.60

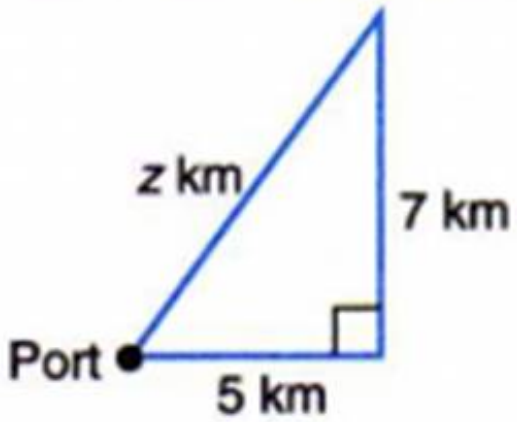
4. If $a = 7$ and $b = 9$, then $c \doteq$ 11.40

5. If $a = 5$ and $b = 12$, then $c =$ 13.

Just always assume the teacher wants the answer rounded to nearest 0.01 as a normal

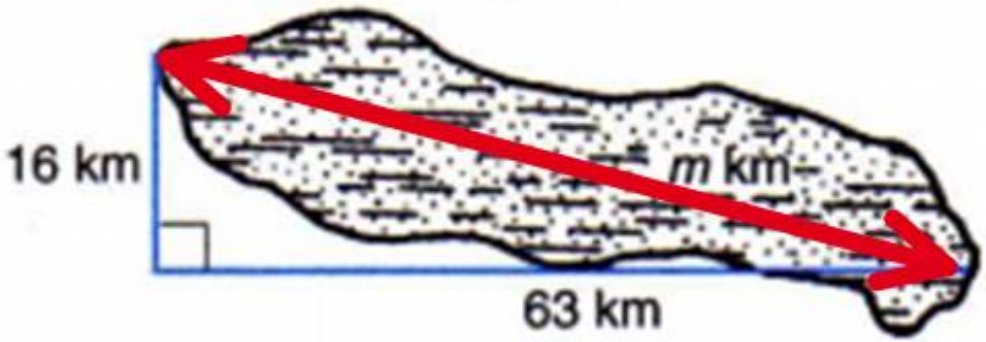
Pause and Do

3. A ship left port and sailed 5 km east and then 7 km north. How far was the ship from the port then?



The ship was about 8.60 km from the port.

4. What is the length of the lake shown below?



The length is 65 km.

lol you could "eyeball" it any he pretty close!

1. If $c = 25$ and $a = 24$, then $b =$ 7.

2. If $c = 41$ and $b = 40$, then $a =$ 9.

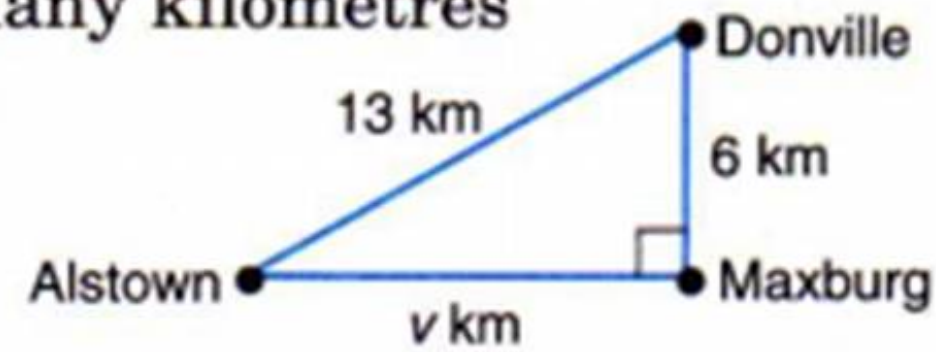
3. If $c = 61$ and $a = 60$, then $b =$ 11.

4. If $c = 25$ and $b = 22$, then $a \doteq$ 11.87

5. If $c = 26$ and $a = 24$, then $b =$ 10.

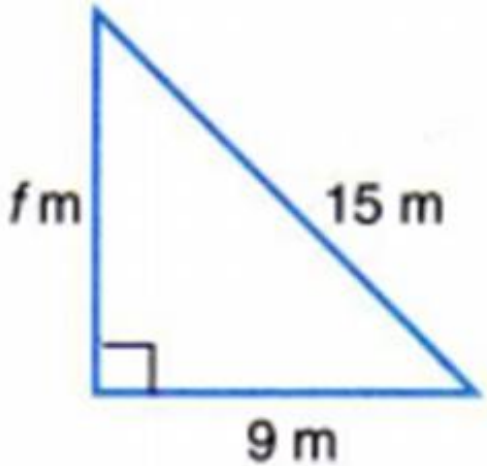
Pause and Do

5. Alstown, Donville, and Maxburg are located as shown below. How many kilometres is it from Alstown to Maxburg?

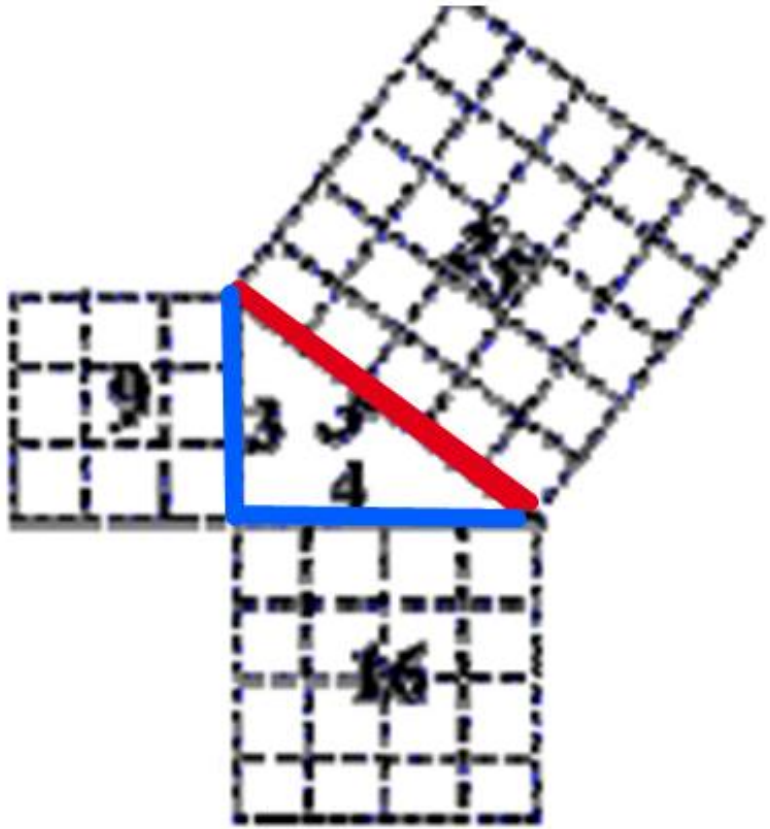


It is about 11.53 km from Alstown to Maxburg.

6. A sail is shaped as shown. How high is the sail?



The sail is 12 m high.


25
9
3
3
4
16