



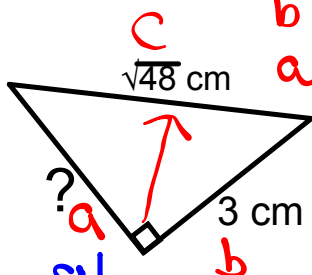
Warm Up Grade 8

Tuesday, Nov. 22

Test Tuesday Nov. 29

Find the length of the missing side (Use calculators but show your work)

a)



$$c = \sqrt{48}$$

$$b = 3$$

$$a = ?$$

Missing side

$$a^2 = c^2 - b^2$$

$$= (\sqrt{48})^2 - (3)^2$$

Rule $(\sqrt{\#})^2 = \#$

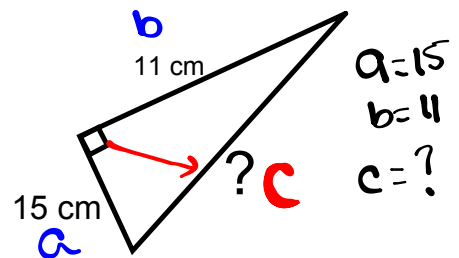
$$= 48 - 9$$

$$a^2 = 39$$

$$\sqrt{a^2} = \sqrt{39}$$

$$a = 6.2 \text{ cm}$$

b)



$$a = 15$$

$$b = 11$$

$$c = ?$$

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

$$= (15)^2 + (11)^2$$

$$= 225 + 121$$

$$c^2 = 346$$

$$\sqrt{c^2} = \sqrt{346}$$

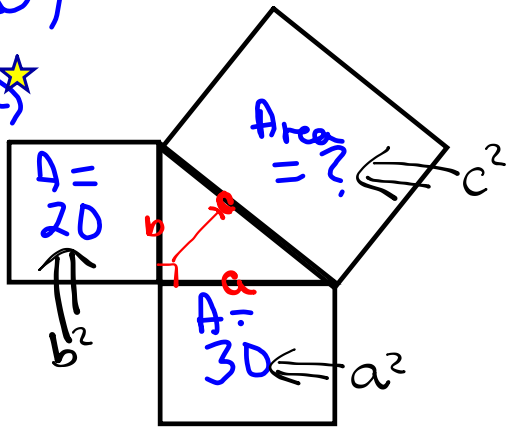
$$c = 18.6 \text{ cm}$$

Homework solutions

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

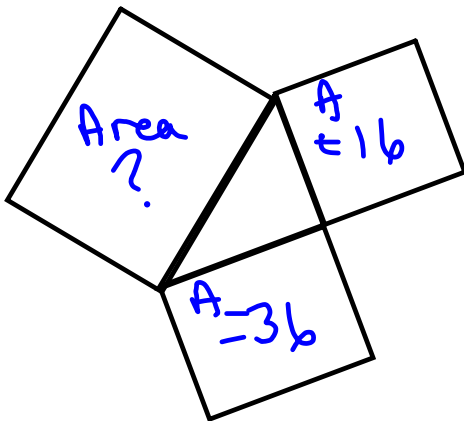
3a)★



Missing Area
 $20 + 30 = 50$

$A = 50$
 Side Length = $\sqrt{50}$

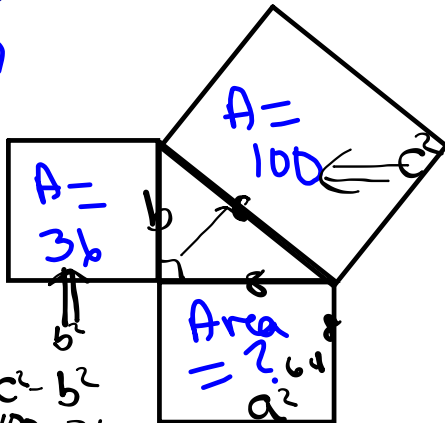
b)



Missing Area
 $16 + 36 = 52$

$A = 52$
 Side Length = $\sqrt{52}$

4★



Missing Area
 $100 - 36 = 64$

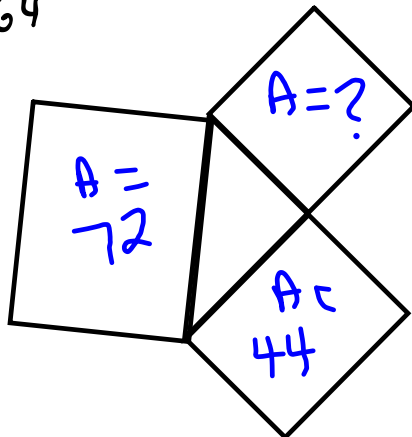
$A = 64$
 Side Length = $\sqrt{64} = 8$

$$a^2 = c^2 - b^2$$

$$a^2 = 100 - 36$$

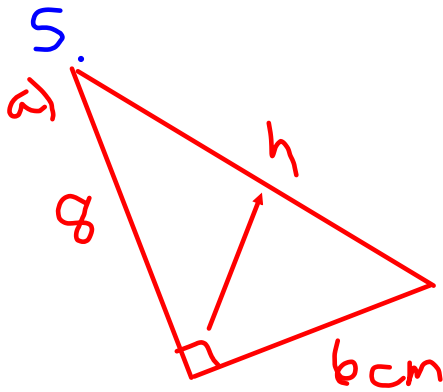
$$a^2 = 64$$

b)



Missing Area
 $72 - 44 = 28$

$A = 28$
 Side Length = $\sqrt{28}$



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

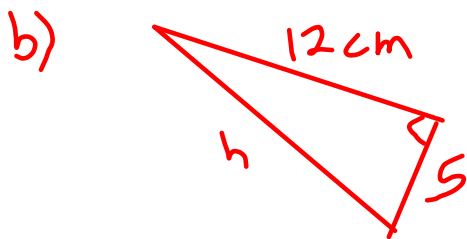
$$c^2 = 8^2 + 6^2$$

$$c^2 = 64 + 36$$

$$c^2 = 100$$

$$\sqrt{c^2} = \sqrt{100}$$

$$c = 10 \text{ cm}$$



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

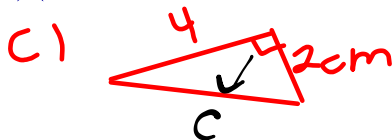
$$c^2 = 12^2 + 5^2$$

$$c^2 = 144 + 25$$

$$c^2 = 169$$

$$\sqrt{c^2} = \sqrt{169}$$

$$c = 13 \text{ cm}$$



$$a = 4$$

$$b = 2$$

$$c = ?$$

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

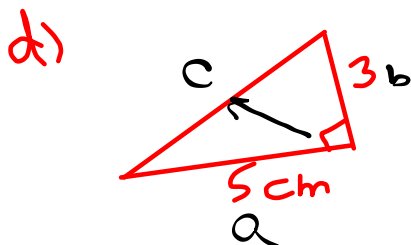
$$c^2 = 4^2 + 2^2$$

$$c^2 = 16 + 4$$

$$c^2 = 20$$

$$\sqrt{c^2} = \sqrt{20}$$

$$c = 4.5 \text{ cm}$$



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

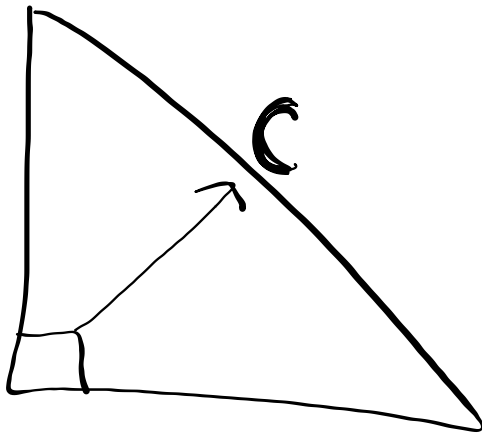
$$c^2 = 5^2 + 3^2$$

$$c^2 = 25 + 9$$

$$c^2 = 34$$

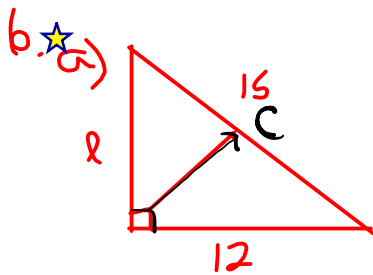
$$\sqrt{c^2} = \sqrt{34}$$

$$c = 5.8 \text{ cm}$$



missing c (add)
 $c^2 = a^2 + b^2$

Given c but miss leg
(subtract)



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

$$15^2 = a^2 + 12^2$$

$$225 = a^2 + 144$$

$$a^2 = c^2 - b^2$$

$$= 15^2 - 12^2$$

$$= 225 - 144$$

$$\sqrt{a^2} = \sqrt{81}$$

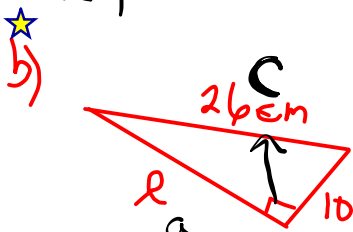
$$a = 9$$

$$225 - 144 = a^2 + 144 - 144$$

$$81 = a^2$$

$$\sqrt{81} = \sqrt{a^2}$$

$$9 = a$$



$$a^2 = c^2 - b^2$$

$$26^2 - 10^2$$

$$676 - 100$$

$$a^2 = 576$$

$$a = \sqrt{576}$$

$$a = 24$$

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

$$26^2 = a^2 + 10^2$$

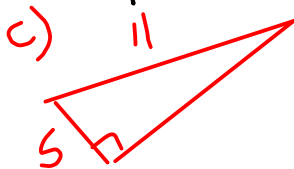
$$676 = a^2 + 100$$

$$676 - 100 = a^2 + 100 - 100$$

$$576 = a^2$$

$$\sqrt{576} = \sqrt{a^2}$$

$$24 = a$$



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

$$11^2 = a^2 + 5^2$$

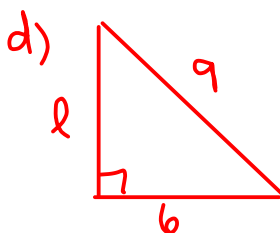
$$121 = a^2 + 25$$

$$121 - 25 = a^2 + 25 - 25$$

$$96 = a^2$$

$$\sqrt{96} = \sqrt{a^2}$$

$$9.8 = a$$



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

$$9^2 = a^2 + 6^2$$

$$81 = a^2 + 36$$

$$81 - 36 = a^2 + 36 - 36$$

$$45 = a^2$$

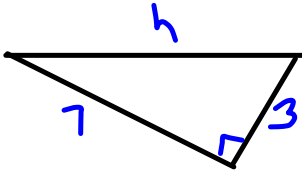
$$\sqrt{45} = \sqrt{a^2}$$

$$6.7 = a$$

Homework solutions

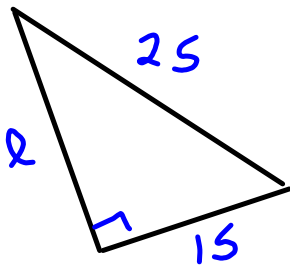
Pg 34

7a)



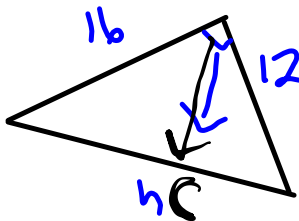
$$\begin{aligned}c^2 &= a^2 + b^2 \\c^2 &= 7^2 + 3^2 \\c^2 &= 49 + 9 \\c^2 &= 58 \\\sqrt{c^2} &= \sqrt{58} \\c &= 7.6\end{aligned}$$

b)



$$\begin{aligned}c^2 &= a^2 + b^2 \\25^2 &= a^2 + 15^2 \\625 &= a^2 + 225 \\625 - 225 &= a^2 + 225 - 225 \\400 &= a^2 \\\sqrt{400} &= \sqrt{a^2} \\20 &= a\end{aligned}$$

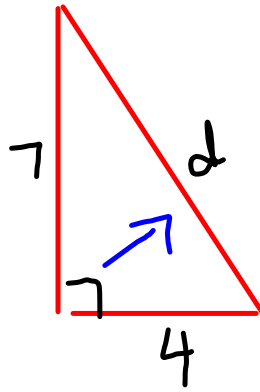
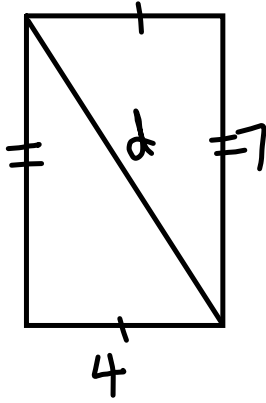
c)★



$$\begin{aligned}c^2 &= a^2 + b^2 \\c^2 &= 12^2 + 16^2 \\c^2 &= 144 + 256 \\c^2 &= 400 \\\sqrt{c^2} &= \sqrt{400} \\c &= 20\end{aligned}$$

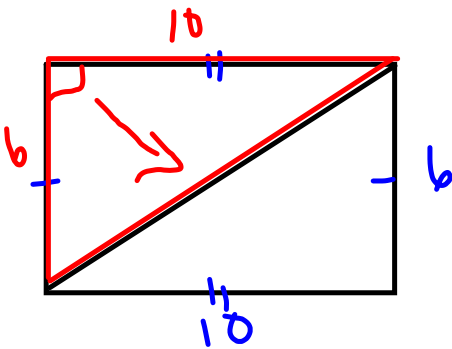
Homework solutions

a) 8



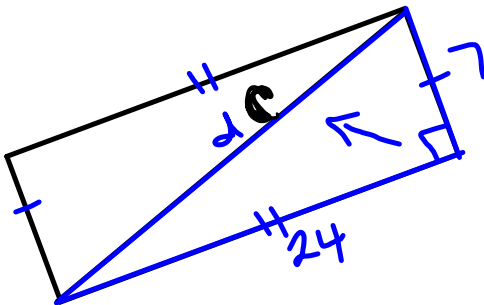
$$\begin{aligned} c^2 &= a^2 + b^2 \\ c^2 &= 7^2 + 4^2 \\ c^2 &= 49 + 16 \\ c^2 &= 65 \\ \sqrt{c^2} &= \sqrt{65} \\ c &= 8.1 \end{aligned}$$

b)



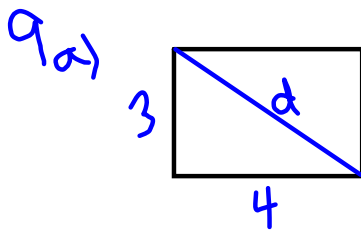
$$\begin{aligned} c^2 &= a^2 + b^2 \\ c^2 &= 10^2 + 6^2 \\ c^2 &= 100 + 36 \\ c^2 &= 136 \\ \sqrt{c^2} &= \sqrt{136} \\ c &= 11.7 \end{aligned}$$

★ c)



$$\begin{aligned} c^2 &= a^2 + b^2 \\ c^2 &= 24^2 + 7^2 \\ c^2 &= 576 + 49 \\ c^2 &= 625 \\ \sqrt{c^2} &= \sqrt{625} \\ c &= 25 \end{aligned}$$

Homework solutions



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

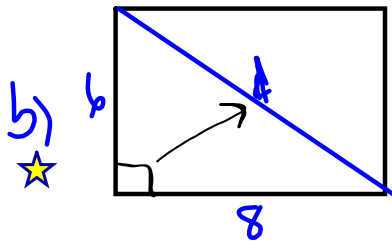
$$c^2 = 3^2 + 4^2$$

$$c^2 = 9 + 16$$

$$c^2 = 25$$

$$\sqrt{c^2} = \sqrt{25}$$

$$c = 5$$



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

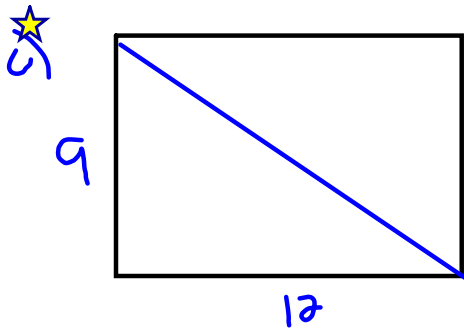
$$c^2 = 6^2 + 8^2$$

$$c^2 = 36 + 64$$

$$c^2 = 100$$

$$\sqrt{c^2} = \sqrt{100}$$

$$c = 10$$



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

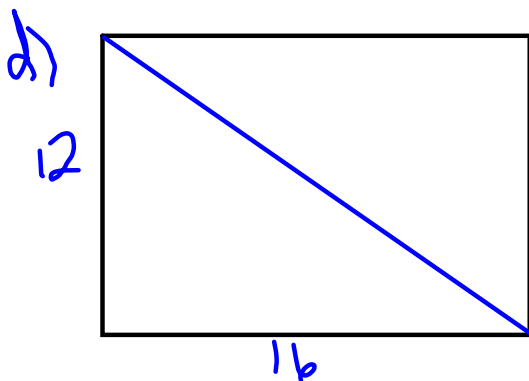
$$c^2 = 9^2 + 12^2$$

$$c^2 = 81 + 144$$

$$c^2 = 225$$

$$\sqrt{c^2} = \sqrt{225}$$

$$c = 15$$



I think the diagonal will be 20.

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

$$c^2 = 12^2 + 16^2$$

$$c^2 = 144 + 256$$

$$c^2 = 400$$

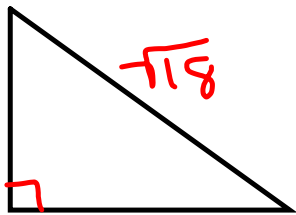
$$\sqrt{c^2} = \sqrt{400}$$

$$c = 20$$

Homework solutions

10.
 😊 If you know the side lengths of a right triangle the hypotenuse will be the largest number since it is always the longest side.

😊 #2.



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

$$(\sqrt{18})^2 = a^2 + b^2$$

$$18 = a^2 + b^2$$

$$9 + 9 = 18$$

$$9 = a^2 \quad 9 = b^2$$

$$3 = a \quad 3 = b$$

$$6 + 12 = 18$$

$$a^2 = 6 \quad b^2 = 12$$

$$a = \sqrt{6} \quad b = \sqrt{12}$$

$$1 + 8 = 18$$

$$a^2 = 1 \quad b^2 = 8$$

$$\sqrt{a^2} = \sqrt{1} \quad \sqrt{b^2} = \sqrt{8}$$

$$a = \sqrt{1} \quad b = \sqrt{8}$$

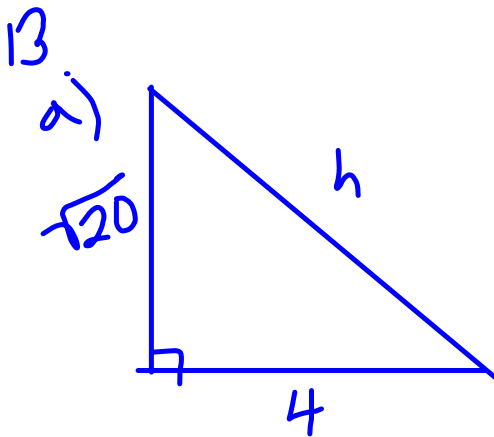
$$1 + 17 = 18$$

$$a^2 = 1 \quad b^2 = 17$$

$$a = \sqrt{1} \quad b = \sqrt{17}$$

$$= 1$$

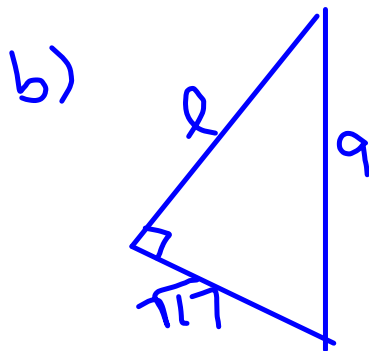
Homework solutions



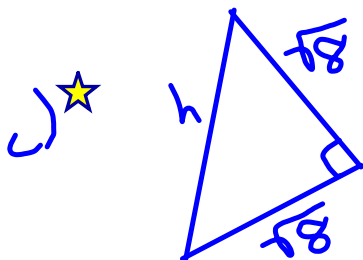
$$\frac{\sqrt{20} \times \sqrt{20}}{\sqrt{20 \times 20}}$$

20

$$\begin{aligned} c^2 &= a^2 + b^2 \\ c^2 &= (\sqrt{20})^2 + 4^2 \\ c^2 &= 20 + 16 \\ c^2 &= 36 \\ \sqrt{c^2} &= \sqrt{36} \\ c &= 6 \end{aligned}$$



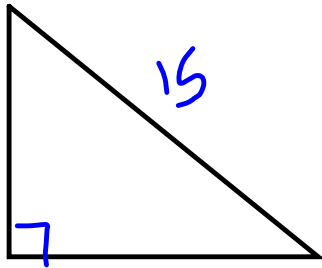
$$\begin{aligned} c^2 &= a^2 + b^2 \\ 9^2 &= a^2 + (\sqrt{17})^2 \\ 81 &= a^2 + 17 \\ 81 - 17 &= a^2 + 17 - 17 \\ 64 &= a^2 \\ \sqrt{64} &= \sqrt{a^2} \\ 8 &= a \end{aligned}$$



$$\begin{aligned} c^2 &= a^2 + b^2 \\ c^2 &= (\sqrt{8})^2 + (\sqrt{8})^2 \\ c^2 &= 8 + 8 \\ c^2 &= 16 \\ \sqrt{c^2} &= \sqrt{16} \\ c &= 4 \end{aligned}$$

Homework solutions

15. hypotenuse = 15



Perfect Squares	
1	4
9	16
25	36
49	64
81	100
121	144
169	196
225	

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

$$15^2 = a^2 + b^2$$

$$225 = a^2 + b^2$$

a and b are whole numbers, so what perfect squares add to give 225?

$$81 + 144 = 225$$

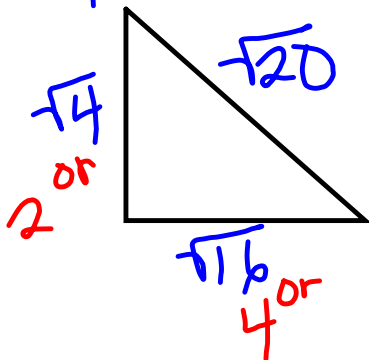
$$a^2 = 81$$

$$a = 9$$

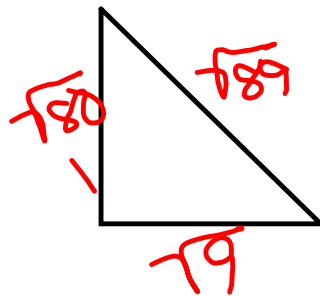
$$b^2 = 144$$

$$b = 12$$

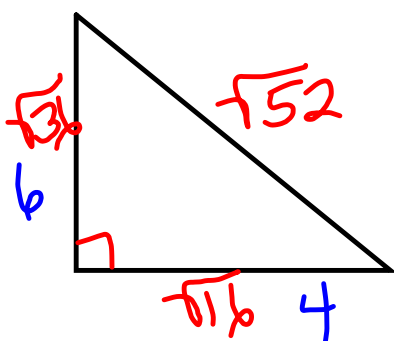
17. a) $h = \sqrt{20}$



b) $\sqrt{89}$



c) $\sqrt{52}$



If you are given the lengths of a triangle, how can you determine if it is a right triangle?

Check

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

You can use Pythagorean Theorem to find out if the square of the longest side equals the sum of the squares of the other 2 sides.

Example 1) Side lengths $a = 10 \text{ cm}$, $b = 14 \text{ cm}$, $c = 17 \text{ cm}$

In our example does $c^2 = a^2 + b^2$?

If it does, it is a right angle triangle, otherwise it is not.

$$c^2 = (17)^2 = 289$$

$$a^2 + b^2 = (10)^2 + (14)^2 = 100 + 196 = 296$$

different
LHS \neq RHS
So Not a Right Δ

$c^2 = a^2 + b^2$
LHS = RHS
+ 289 = 296

c longest

Similar to test question
Example 2)

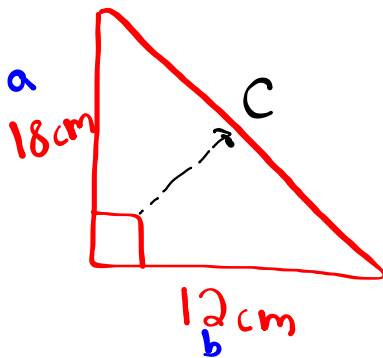
biggest
C

Is the triangle with sides 6, 8, and 10 a right angle triangle?
(Show work)

$$\begin{array}{r} c^2 \\ 10^2 \\ 100 \end{array} \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} \begin{array}{r} a^2 + b^2 \\ \downarrow \downarrow \\ 6^2 + 8^2 \\ 36 + 64 \\ 100 \end{array}$$

Same
Right angle Δ

a) Find the missing side



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

$$c^2 = 18^2 + 12^2$$

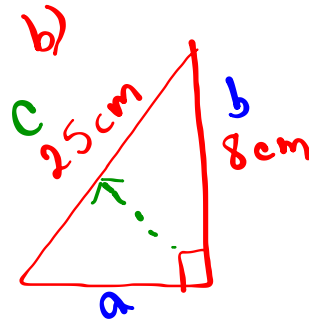
$$c^2 = 324 + 144$$

$$c^2 = 468$$

$$\sqrt{c^2} = \sqrt{468}$$

$$c = 21.6 \text{ cm}$$

Area of
Square
off side 'c'



$$a^2 = c^2 - b^2$$

$$a^2 = 25^2 - 8^2$$

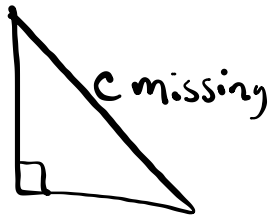
$$a^2 = 625 - 64$$

$$a^2 = 561$$

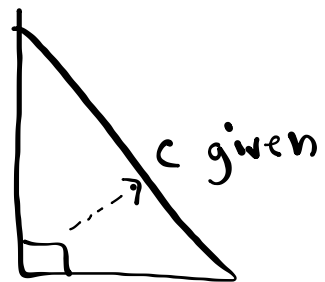
$$\sqrt{a^2} = \sqrt{561}$$

$$a = 23.6$$

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



$$a^2 = c^2 - b^2$$

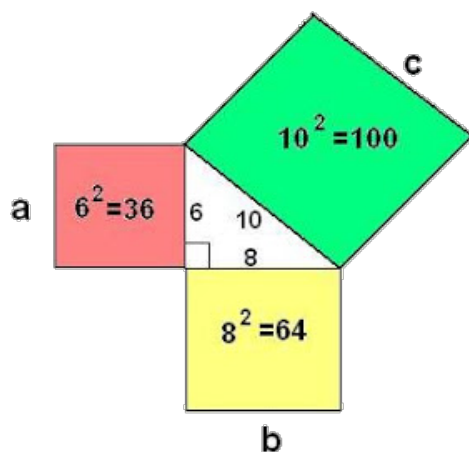


Pythagorean Triple:

is a set of 3 whole numbers that satisfies $c^2 = a^2 + b^2$

Example 1) 3,4,5
since $5^2 = 3^2 + 4^2$

Example 2) 7, 24, 25
since $25^2 = 7^2 + 24^2$



Class/Homework

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#4(a,b)

#6 (a,c,~~b~~)



#8



$$c^2 \left. \vphantom{c^2} \right\} a^2 + b^2$$