



Warm Up Grade 8

Friday, Nov. 23

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

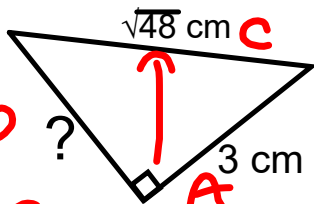


$$b^2 = c^2 - a^2$$



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

a)



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

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

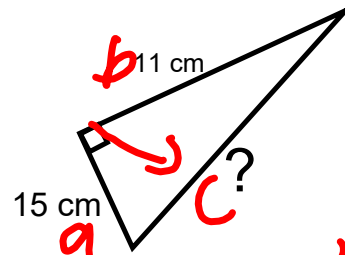
$$= 48 \text{ cm}^2 - 9 \text{ cm}^2$$

$$b^2 = 39$$

$$b = \sqrt{39}$$

$$b \approx 6.4$$

b)



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

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

$$c^2 = 225 + 121$$

$$c^2 = 346$$

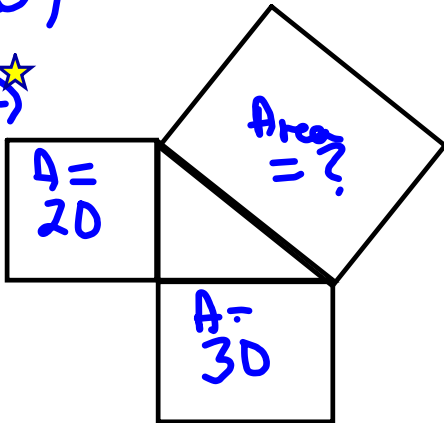
$$c = \sqrt{346}$$

$$c \approx 18.6$$

Homework solutions

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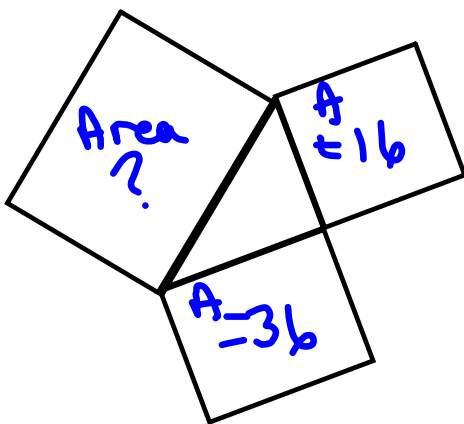
3a)★



Missing Area
 $20 + 30 = 50$

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

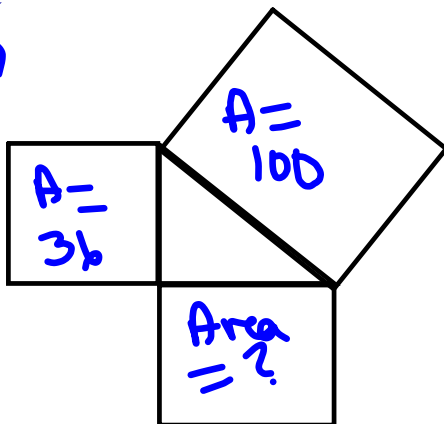
b)



Missing Area
 $16 + 36 = 52$

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

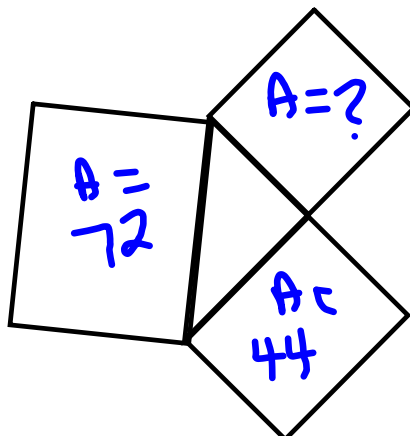
4a)★



Missing Area
 $100 - 36 = 64$

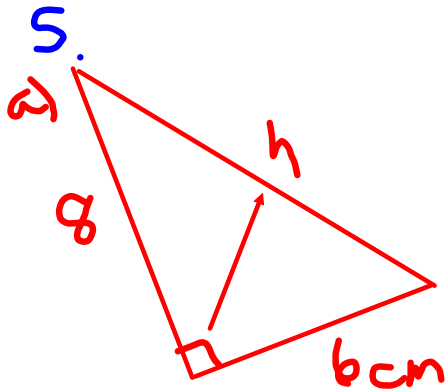
$A = 64$
 Side Length = $\sqrt{64} = 8$

b)



Missing Area
 $72 - 44 = 28$

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



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

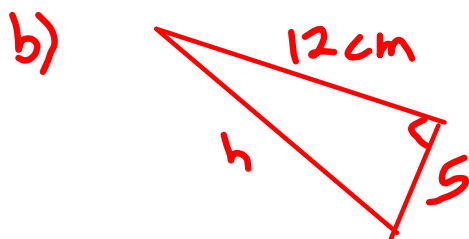
$$c^2 = 8^2 + 6^2$$

$$c^2 = 64 + 36$$

$$c^2 = 100$$

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

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



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

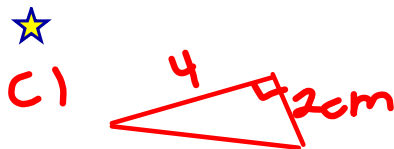
$$c^2 = 12^2 + 5^2$$

$$c^2 = 144 + 25$$

$$c^2 = 169$$

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

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



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

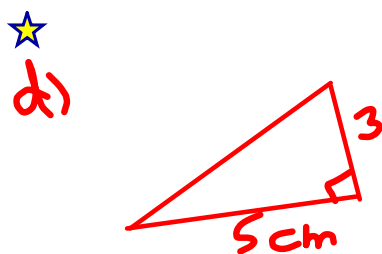
$$c^2 = 4^2 + 2^2$$

$$c^2 = 16 + 4$$

$$c^2 = 20$$

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

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



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

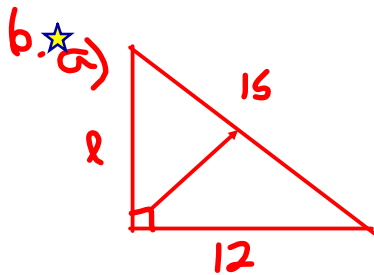
$$c^2 = 5^2 + 3^2$$

$$c^2 = 25 + 9$$

$$c^2 = 34$$

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

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



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

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

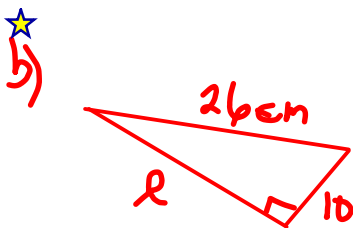
$$225 = a^2 + 144$$

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

$$81 = a^2$$

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

$$9 = a$$



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

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

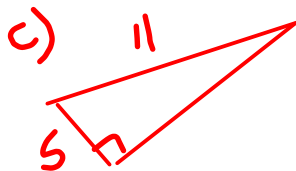
$$676 = a^2 + 100$$

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

$$576 = a^2$$

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

$$24 = a$$



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

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

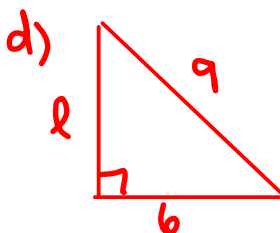
$$121 = a^2 + 25$$

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

$$96 = a^2$$

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

$$9.8 = a$$



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

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

$$81 = a^2 + 36$$

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

$$45 = a^2$$

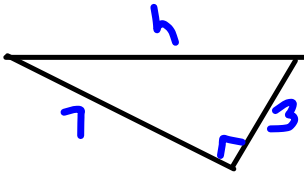
$$\sqrt{45} = \sqrt{a^2}$$

$$6.7 = a$$

Homework solutions

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7a)



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

$$c^2 = 7^2 + 3^2$$

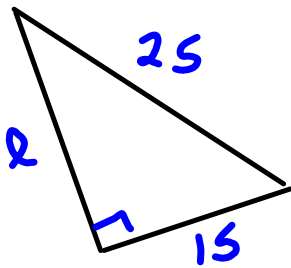
$$c^2 = 49 + 9$$

$$c^2 = 58$$

$$\sqrt{c^2} = \sqrt{58}$$

$$c = 7.6$$

b)



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

$$25^2 = a^2 + 15^2$$

$$625 = a^2 + 225$$

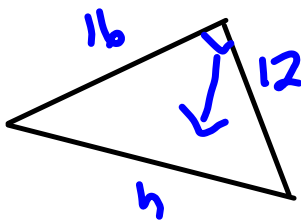
$$625 - 225 = a^2 + 225 - 225$$

$$400 = a^2$$

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

$$20 = a$$

c)★



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

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

$$c^2 = 144 + 256$$

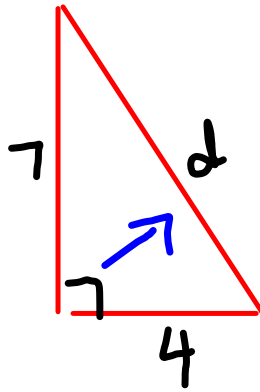
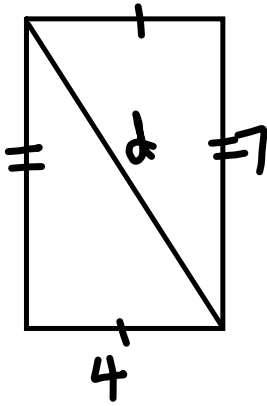
$$c^2 = 400$$

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

$$c = 20$$

Homework solutions

a) 8



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

$$c^2 = 7^2 + 4^2$$

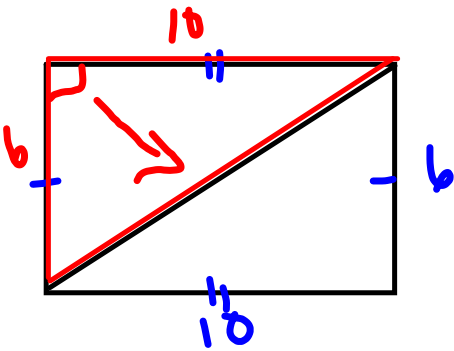
$$c^2 = 49 + 16$$

$$c^2 = 65$$

$$\sqrt{c^2} = \sqrt{65}$$

$$c = 8.1$$

b)



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

$$c^2 = 10^2 + 6^2$$

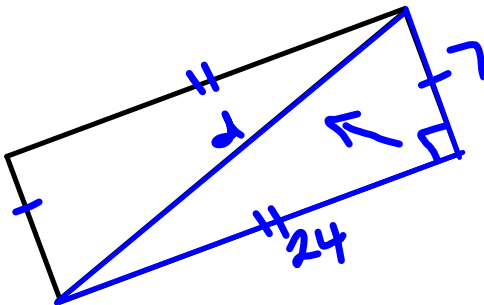
$$c^2 = 100 + 36$$

$$c^2 = 136$$

$$\sqrt{c^2} = \sqrt{136}$$

$$c = 11.7$$

★ c)



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

$$c^2 = 24^2 + 7^2$$

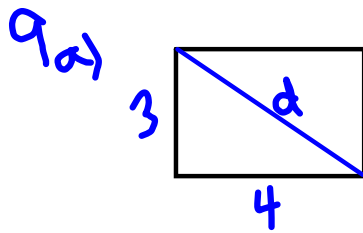
$$c^2 = 576 + 49$$

$$c^2 = 625$$

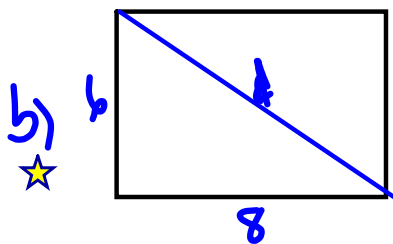
$$\sqrt{c^2} = \sqrt{625}$$

$$c = 25$$

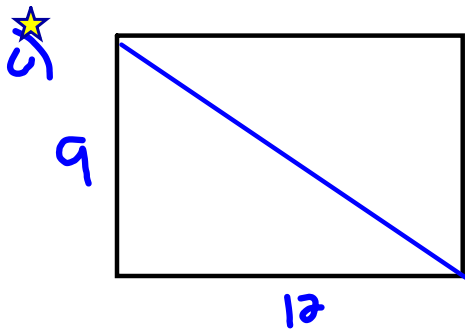
Homework solutions



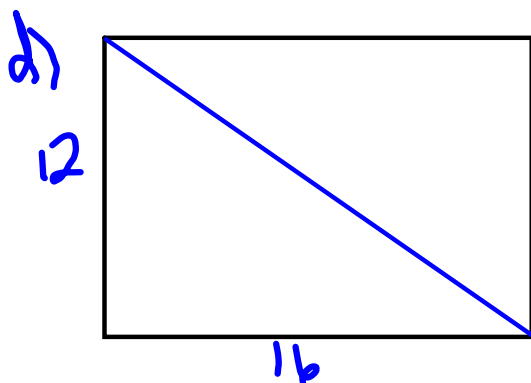
$$\begin{aligned}c^2 &= a^2 + b^2 \\c^2 &= 3^2 + 4^2 \\c^2 &= 9 + 16 \\c^2 &= 25 \\\sqrt{c^2} &= \sqrt{25} \\c &= 5\end{aligned}$$



$$\begin{aligned}c^2 &= a^2 + b^2 \\c^2 &= 6^2 + 8^2 \\c^2 &= 36 + 64 \\c^2 &= 100 \\\sqrt{c^2} &= \sqrt{100} \\c &= 10\end{aligned}$$




$$\begin{aligned}c^2 &= a^2 + b^2 \\c^2 &= 9^2 + 12^2 \\c^2 &= 81 + 144 \\c^2 &= 225 \\\sqrt{c^2} &= \sqrt{225} \\c &= 15\end{aligned}$$



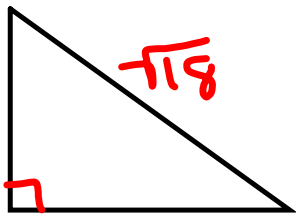
I think the diagonal will be 20.

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

Homework solutions

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. 



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

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

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

$$9 + 9 = 18$$

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

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

$$6 + 12 = 18$$

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

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

$$16 + 8 = 18$$

$$a^2 = 16 \quad b^2 = 8$$

$$\sqrt{a^2} = \sqrt{16} \quad \sqrt{b^2} = \sqrt{8}$$

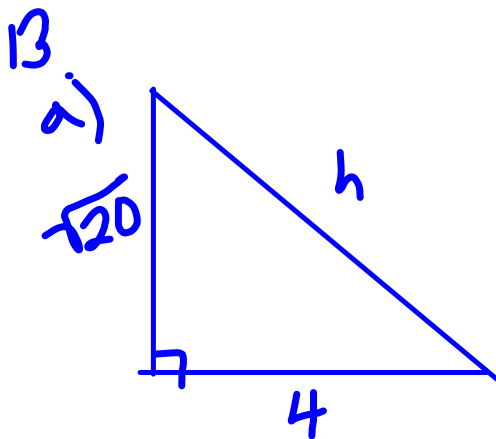
$$a = 4 \quad b = \sqrt{8}$$

$$1 + 17 = 18$$

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

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

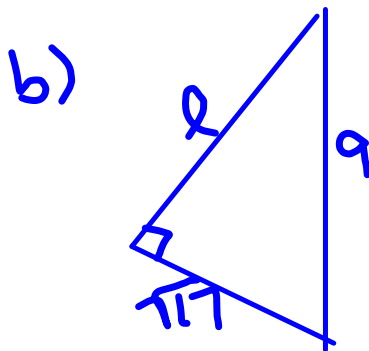
Homework solutions



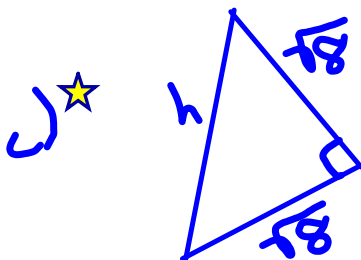
$$\frac{\sqrt{20} \times \sqrt{20}}{\sqrt{20 \times 20}}$$

20

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



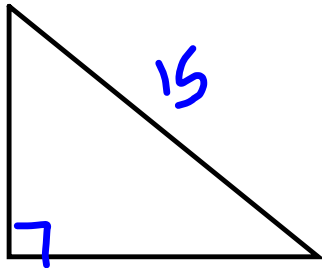
$$\begin{aligned} c^2 &= a^2 + b^2 \\ 8^2 &= a^2 + (\sqrt{17})^2 \\ 81 &= a^2 + 17 \\ 81 - 17 &= a^2 + 17 - 17 \\ 64 &= a^2 \\ \sqrt{64} &= \sqrt{a^2} \\ 8 &= a \end{aligned}$$



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

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?

$$81 + 144 = 225$$

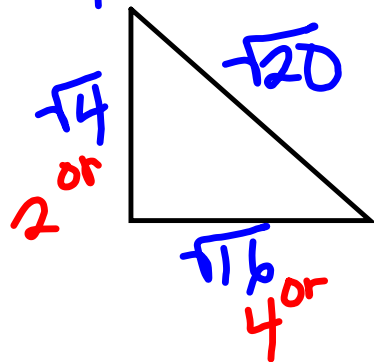
$$a^2 = 81$$

$$a = 9$$

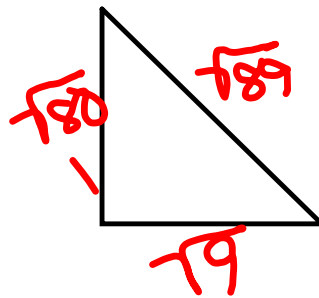
$$b^2 = 144$$

$$b = 12$$

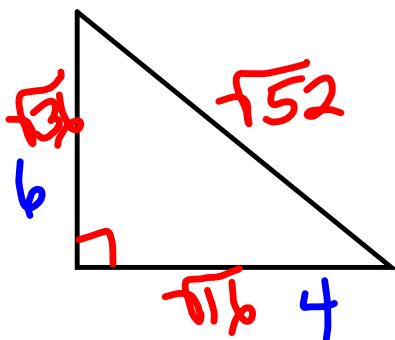
17. a) $h = \sqrt{20}$



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

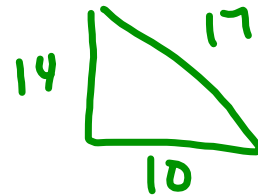
$$c^2 = a^2 + b^2$$

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.

put 'c' over biggest side (#)
→ label other two sides "a" "b"

Example 1) Side lengths 10 cm, 14 cm, 17 cm

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



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

$$c^2$$

$$17^2$$

$$289$$

$$a^2 + b^2$$

$$10^2 + 14^2$$

$$100 + 196$$

← different → 296
Not a right Δ

Example 2)

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

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

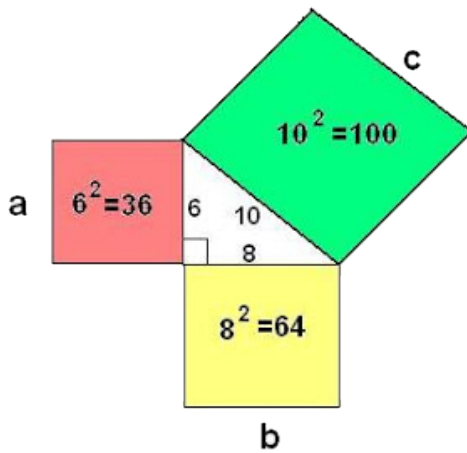
Same
so makes
a right Δ

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,f)

#7(a,f)

#8



h