Warm Up Grade 8

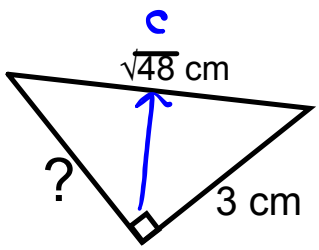
Friday, Nov. 17

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

$a^2 = c^2 - b^2$ or $b^2 = c^2 - a^2$ missing leg

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

a)



Given

$c = \sqrt{48}$ cm

$a = 3$ cm

$b = ?$ ← missing leg

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

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

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

$b^2 = 39\text{cm}^2$

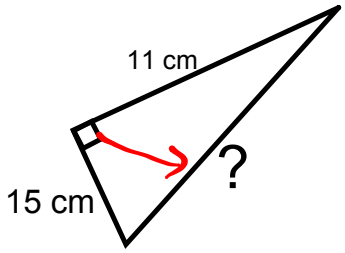
$\sqrt{b^2} = \sqrt{39\text{cm}}$

$b \approx \sqrt{39}$ cm

or

$b \approx 6.2$ cm

b)



$a = 11$ cm

$b = 15$ cm

$c = ?$

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

$c^2 = (11\text{cm})^2 + (15\text{cm})^2$

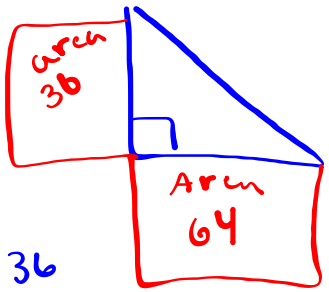
$c^2 = 121\text{cm}^2 + 225\text{cm}^2$

$c^2 = 346\text{cm}^2$

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

$c = \sqrt{346}$ cm

$c \approx 18.60$ cm



$a^2 = 36$

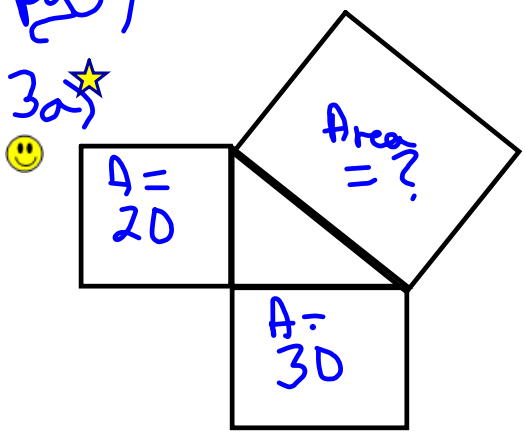
$b^2 = 64$

$c^2 = ?$

Homework solutions

Pg 34

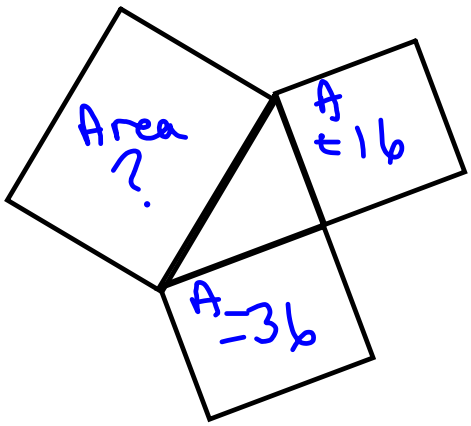
3a)



Missing Area
$20 + 30 = 50$

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

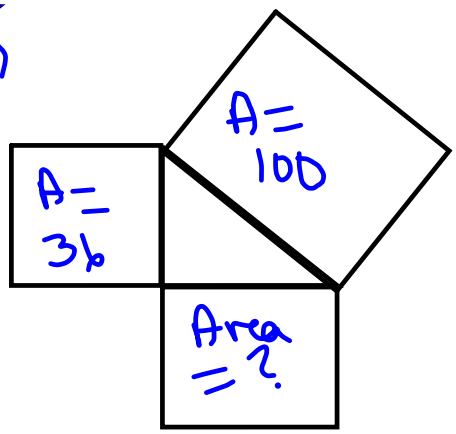
b)



Missing Area
$16 + 36 = 52$

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

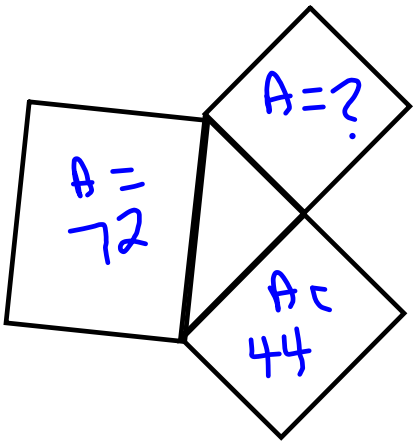
4 a)



Missing Area
$100 - 36$
64

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

b)

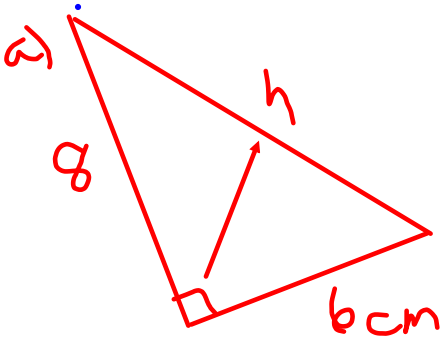


Missing Area
$72 - 44 = 28$

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

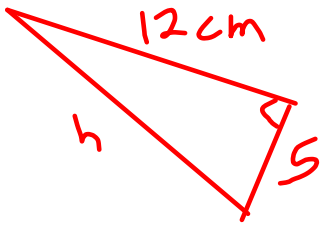
5.

a)



$c^2 = a^2 + b^2$
$c^2 = 8^2 + 6^2$
$c^2 = 64 + 36$
$c^2 = 100$
$\sqrt{c^2} = \sqrt{100}$
$c = 10\text{cm}$

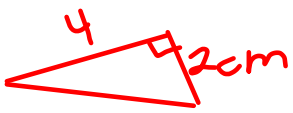
b)



$c^2 = a^2 + b^2$
$c^2 = 12^2 + 5^2$
$c^2 = 144 + 25$
$c^2 = 169$
$\sqrt{c^2} = \sqrt{169}$
$c = 13\text{cm}$

☆

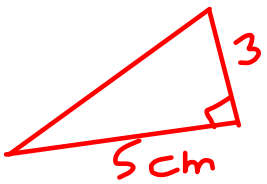
c)



$c^2 = a^2 + b^2$
$c^2 = 4^2 + 2^2$
$c^2 = 16 + 4$
$c^2 = 20$
$\sqrt{c^2} = \sqrt{20}$
$c = 4.5\text{cm}$

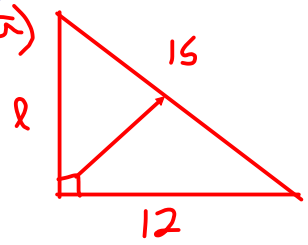
☆

d)



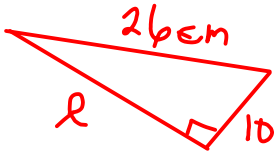
$c^2 = a^2 + b^2$
$c^2 = 5^2 + 3^2$
$c^2 = 25 + 9$
$c^2 = 34$
$\sqrt{c^2} = \sqrt{34}$
$c = 5.8\text{cm}$

6. a)



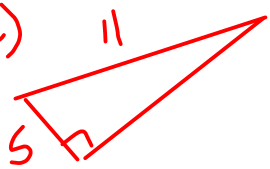
$c^2 = a^2 + b^2$
$15^2 = a^2 + 12^2$
$225 = a^2 + 144$
$225 - 144 = a^2 + 144 - 144$
$81 = a^2$
$\sqrt{81} = \sqrt{a^2}$
$9 = a$

b)



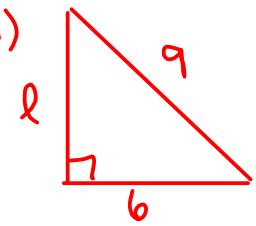
$c^2 = a^2 + b^2$
$26^2 = a^2 + 10^2$
$676 = a^2 + 100$
$676 - 100 = a^2 + 100 - 100$
$576 = a^2$
$\sqrt{576} = \sqrt{a^2}$
$24 = a$

c)



$c^2 = a^2 + b^2$
$11^2 = a^2 + 5^2$
$121 = a^2 + 25$
$121 - 25 = a^2 + 25 - 25$
$96 = a^2$
$\sqrt{96} = \sqrt{a^2}$
$9.8 = a$

d)

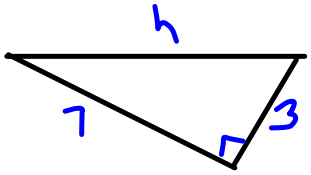


$c^2 = a^2 + b^2$
$9^2 = a^2 + 6^2$
$81 = a^2 + 36$
$81 - 36 = a^2 + 36 - 36$
$45 = a^2$
$\sqrt{45} = \sqrt{a^2}$
$6.7 = a$

Homework solutions

Pg 34

7a)



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

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

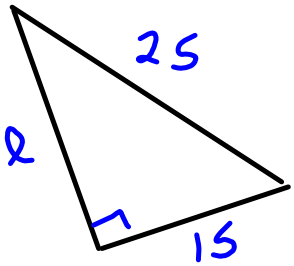
$c^2 = 49 + 9$

$c^2 = 58$

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

$c = 7.6$

b)



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

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

$625 = a^2 + 225$

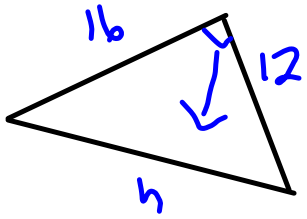
$625 - 225 = a^2 + 225 - 225$

$400 = a$

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

$20 = a$

c)



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

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

$c^2 = 144 + 256$

$c^2 = 400$

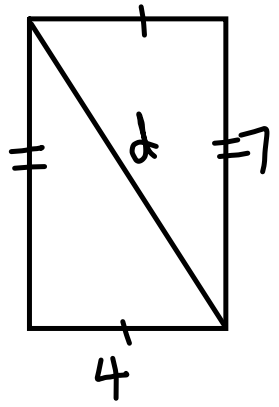
$\sqrt{c^2} = \sqrt{400}$

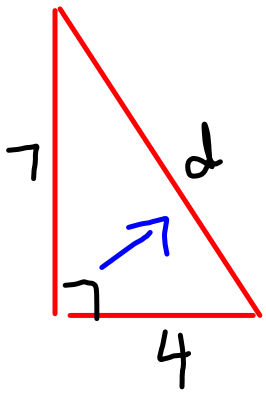
$c = 20$

Homework solutions

8

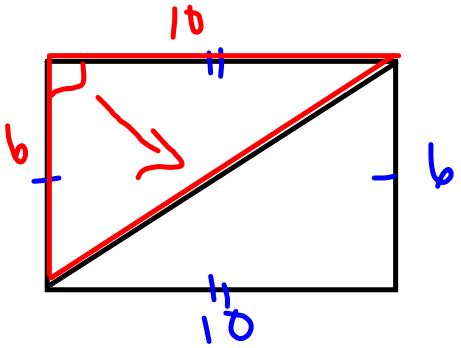
a)





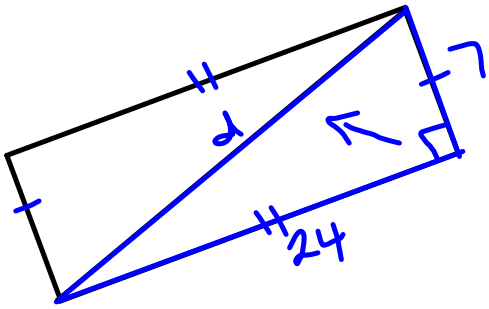
$c^2 = a^2 + b^2$
$c^2 = 7^2 + 4^2$
$c^2 = 49 + 16$
$c^2 = 65$
$\sqrt{c^2} = \sqrt{65}$
$c = 8.1$

b)



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

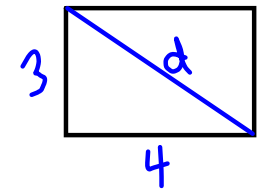
c)



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

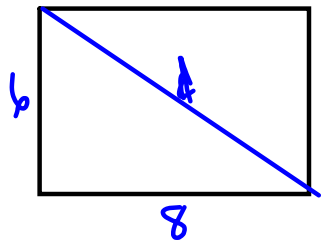
Homework solutions

9a)



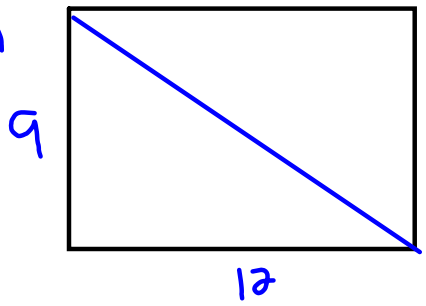
$c^2 = a^2 + b^2$
$c^2 = 3^2 + 4^2$
$c^2 = 9 + 16$
$c^2 = 25$
$\sqrt{c^2} = \sqrt{25}$
$c = 5$

b)



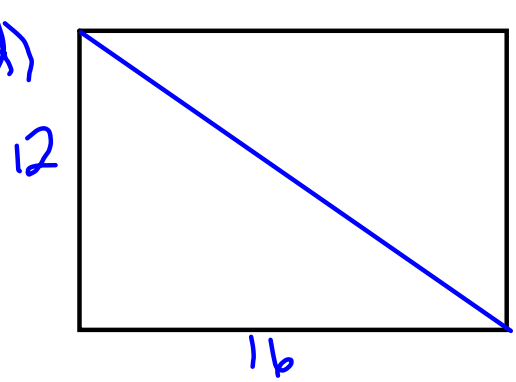
$c^2 = a^2 + b^2$
$c^2 = 6^2 + 8^2$
$c^2 = 36 + 64$
$c^2 = 100$
$\sqrt{c^2} = \sqrt{100}$
$c = 10$

c)



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

d)



I think the diagonal will be 20.

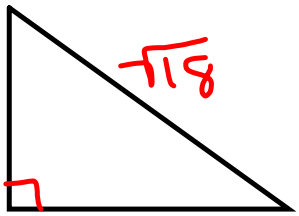
$c^2 = a^2 + b^2$
$c^2 = 12^2 + 16^2$
$c^2 = 144 + 256$
$c^2 = 400$
$\sqrt{c^2} = \sqrt{400}$
$c = 20$

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.

12.



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

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

$18 = a^2 + b^2$

$9 + 9 = 18$

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

$3 = a \quad 3 = b$

$6 + 12 = 18$

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

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

$10 + 8 = 18$

$a^2 = 10 \quad b^2 = 8$

$\sqrt{a^2} = \sqrt{10} \quad \sqrt{b^2} = \sqrt{8}$

$a = \sqrt{10} \quad b = \sqrt{8}$

$1 + 17 = 18$

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

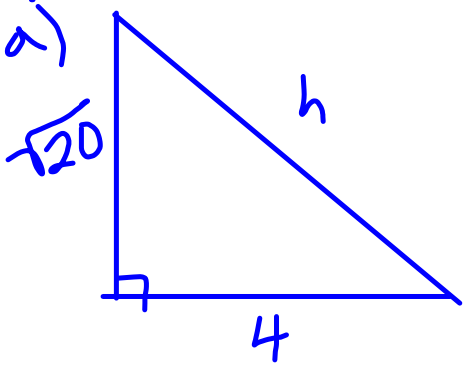
$a = \sqrt{1} \quad b = \sqrt{17}$

$= 1$

Homework solutions

13

a)



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

$c^2 = (\sqrt{20})^2 + 4^2$

$c^2 = 20 + 16$

$c^2 = 36$

$\sqrt{c^2} = \sqrt{36}$

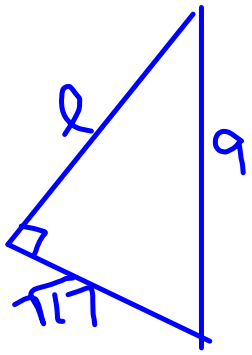
$c = 6$

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

$\sqrt{20 \times 20}$

20

b)



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

$9^2 = a^2 + (\sqrt{17})^2$

$81 = a^2 + 17$

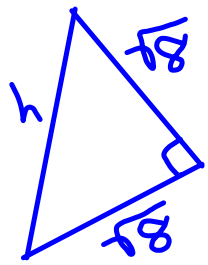
$81 - 17 = a^2 + 17 - 17$

$64 = a^2$

$\sqrt{64} = \sqrt{a^2}$

$8 = a$

c)★



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

$c^2 = (\sqrt{8})^2 + (\sqrt{8})^2$

$c^2 = 8 + 8$

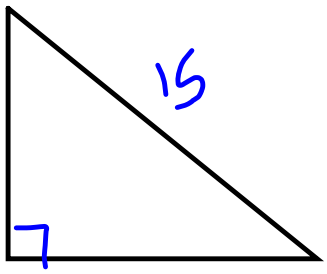
$c^2 = 16$

$\sqrt{c^2} = \sqrt{16}$

$c = 4$

Homework solutions

15. hypotenuse = 15



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

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

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

$225 = a^2 + b^2$

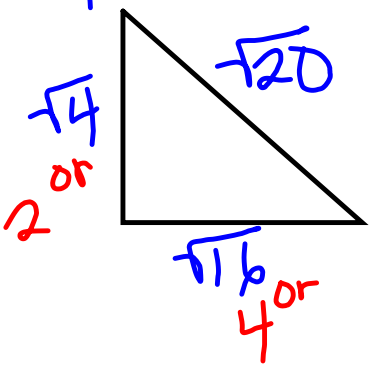
a and b are whole numbers, so what perfect squares add to give 225?

$81 + 144 = 225$

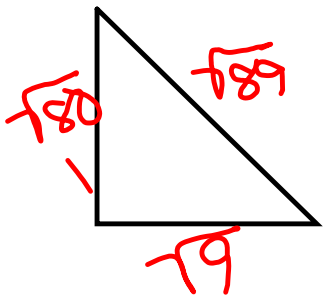
$a^2 = 81$ $\quad b^2 = 144$

$a = 9$ $\quad b = 12$

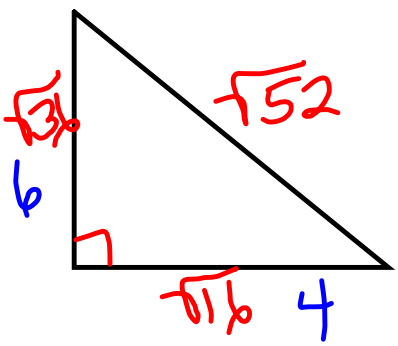
17. a) $h = \sqrt{20}$



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 10 cm , 14 cm, 17 cm

a b c

largest # so must be hypotenuse so label other 2 sides a, b

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

$(17\text{ cm})^2$

289 cm^2

$a^2 + b^2$

$(10\text{cm})^2 + (14\text{cm})^2$

$100\text{cm}^2 + 196\text{cm}^2$

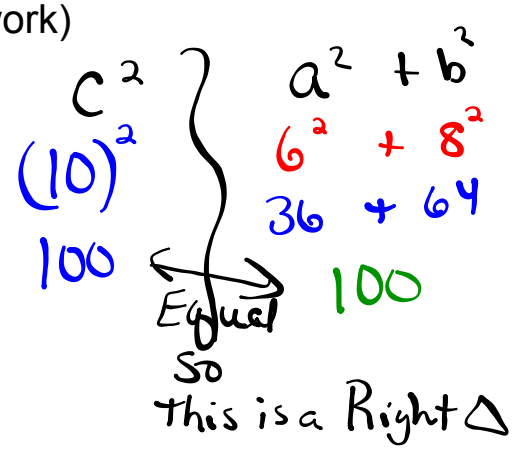
296cm^2

Not the same so not a right $\triangle$

Example 2)

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

a b c



Pythagorean Triple:

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

Example 1) 3,4,5

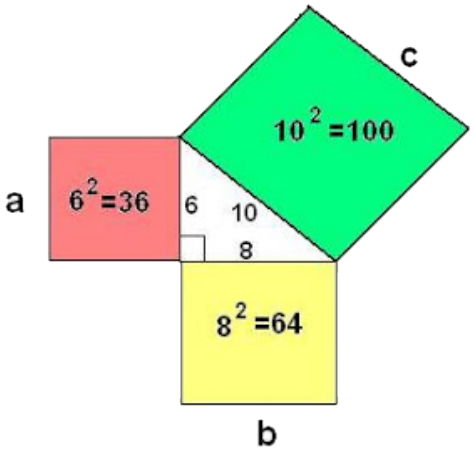
since $5^2 = 3^2 + 4^2$

$25 = 9 + 16$

25

Example 2) 7, 24, 25

since $25^2 = 7^2 + 24^2$



Class/Homework

Test Tuesday Nov. 28

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#4(a,b)

#6 (a,c,f)

#7(a,f)

#8