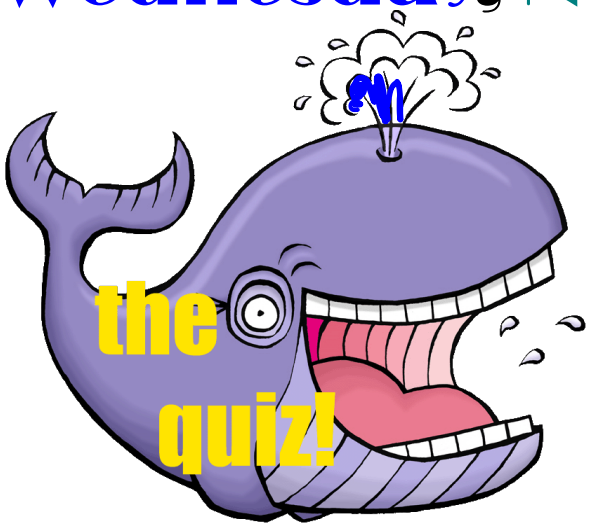
Warm Up Quiz Grade 8

Wednesday, Nov. 15



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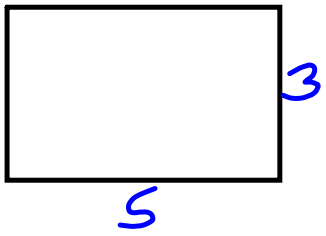
1a) 15 is not a perfect square



1x15

3x5

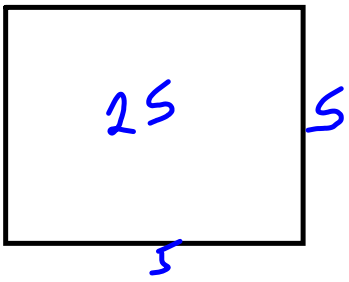
No repeats of factors so not a perfect square

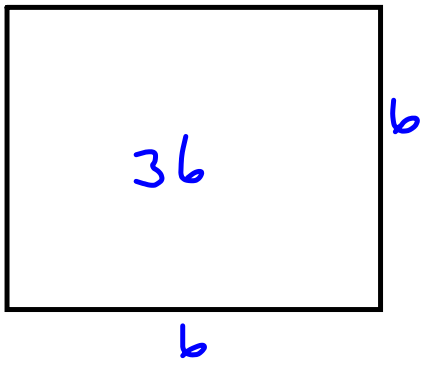
b) 26 is not a perfect, 5x5 is a square which is 25

1x26

2x13

NO Repeats





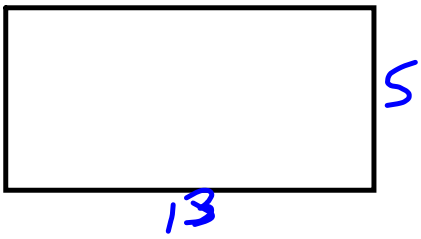
c) 65 - not a square

8x8 = 64, is a square

1x65

5x13

No repeats



d) 100 - perfect square

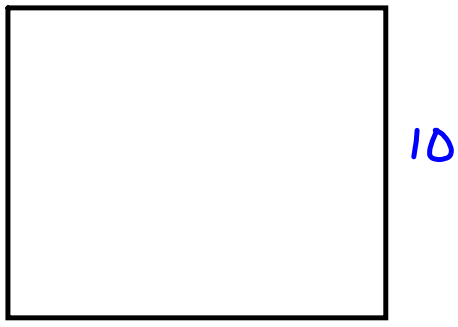
1x100

2x50

4x25

5x20

10x10 repeated so perfect square



2a) $\sqrt{16} = 4$
$(4^2 = 16)$

b) $\sqrt{49} = 7$
$(7 \times 7 = 49)$

c) $\sqrt{196}$
$= \sqrt{14 \times 14}$
$= 14$

d) $\sqrt{400}$
$\sqrt{4 \times 100}$
$\sqrt{4} \times \sqrt{100}$
2×10
20

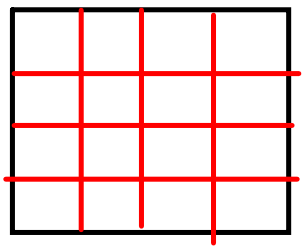
3a) $11^2 = 11 \times 11$
$= 121$

b) $\sqrt{64} = 8$
$(8 \times 8 = 64)$

c) $\sqrt{169} = 13$
$13^2 = 169$

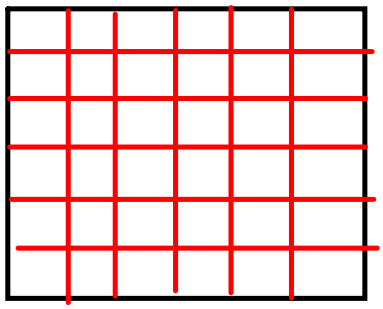
d) $\sqrt{225}$
$\sqrt{15 \times 15}$
15

4a)



Area = 16
Side Length $= \sqrt{16}$
$= 4$

b)



Area = 36
Side Length $= \sqrt{36}$
$= 6$

5a) 216

1 x 216
2 x 108
3 x 72
4 x 54
6 x 36
8 x 27
9 x 24
12 x 18

16 factor
- an even number of factors, so not a perfect square

b) 364

1 x 364
2 x 182
4 x 91
7 x 52
13 x 28
14 x 26

12 factors, not a perfect square

c) 729

1 x 729
3 x 243
9 x 81
27 x 27

7 factor
729 is a perfect square

$\sqrt{729} = 27$

6. If you know a square number you can find the square root by:
   - using prime factorization
   - product of perfect squares
   - list the factors
   - find what number you multiply by itself to get the square number

7a) 24 is not a perfect square, so the side length is not a whole number.

Area = 24 Side Length = $\sqrt{24}$

$\sqrt{16}$ $\sqrt{25}$
4 5

$\sqrt{24} \approx 4.9$

b) Side Length of Square = 9

Area = 9 x 9
= 81

9a) $\sqrt{12 \times 12}$
= 12

b) $\sqrt{34 \times 34}$
= 34

10 a)

$\sqrt{3}$

$\sqrt{1}$ $\sqrt{4}$

1 2

$\sqrt{3} \approx 1.7$

b)

$\sqrt{65}$

$\sqrt{64}$ $\sqrt{81}$

8 9

$\sqrt{65} \approx 8.1$

c)

$\sqrt{72}$

$\sqrt{64}$ $\sqrt{81}$

8 9

$\sqrt{72} \approx 8.5$

d)

$\sqrt{50}$

$\sqrt{49}$ $\sqrt{64}$

7 8

$\sqrt{50} \approx 7.1$

11 a)

$\sqrt{17}$

$\sqrt{16}$ $\sqrt{25}$

4 5

$\sqrt{17} \approx 4.1$

b)

$\sqrt{108}$

$\sqrt{100}$ $\sqrt{121}$

10 11

$\sqrt{108} \approx 10.4$

c)

$\sqrt{33}$

$\sqrt{25}$ $\sqrt{36}$

5 6

$\sqrt{33} \approx 5.8$

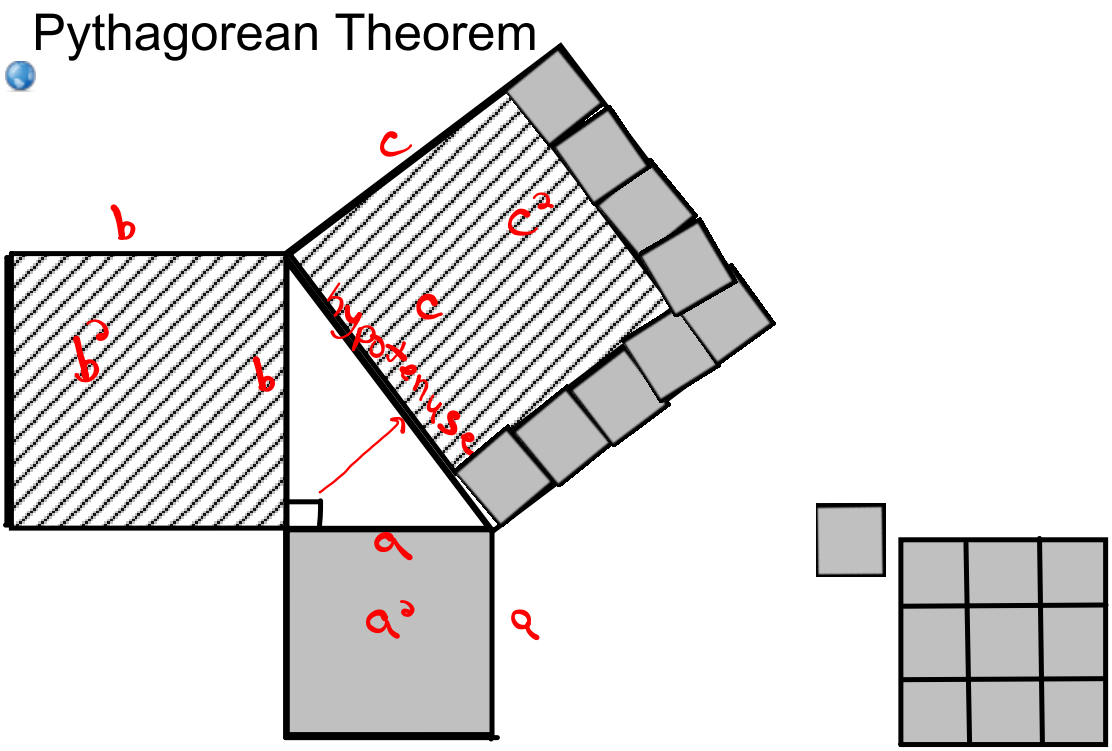
d)

$\sqrt{79}$

$\sqrt{64}$ $\sqrt{81}$

8 9

$\sqrt{79} \approx 8.8$


Pythagorean Theorem
c
b
c^2
b^2
b
c
hypotenuse
a
a^2
a

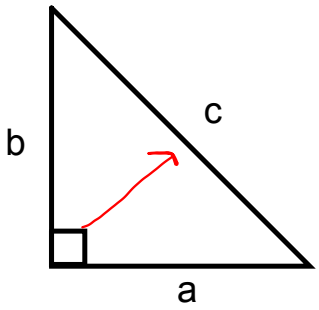
Pythagorean Theorem

- Right Angle Triangle has one angle that 90°

- the side directly across to the right angle is always the longest side, it is the **hypotenuse.**

We use "c" for the hypotenuse

- Legs are side "a" and "b"



Pythagorean Theorem Equation:

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

area of the square off the hypotenuse

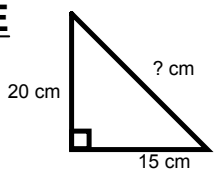
$$(c)^2 - (b)^2 = (a)^2$$

area of the square off the leg

Pythagorean Theorem Equation:

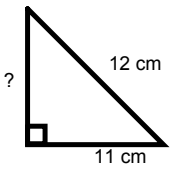
Then to find the length of the **HYPOTENUSE**

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



Then to find the length of a **LEG**

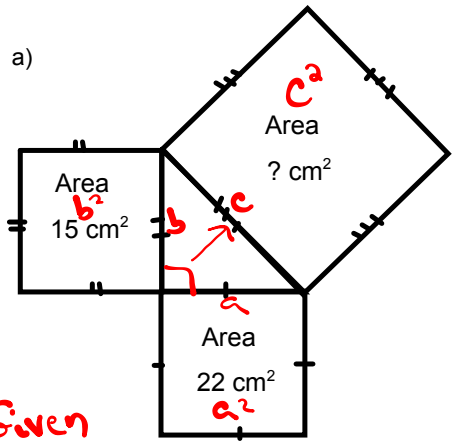
$$a = \sqrt{(c)^2 - (b)^2}$$



Example)

Find the area of the indicated square:

a)



Given

$a^2 = 22\,cm^2$

$b^2 = 15\,cm^2$

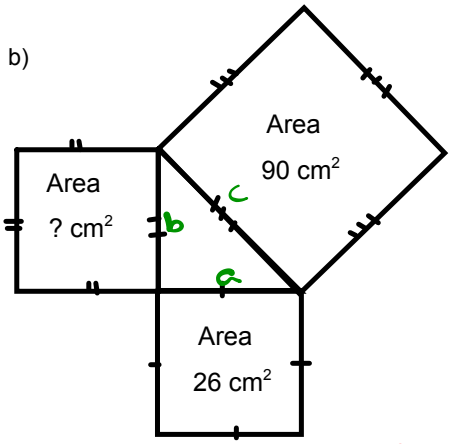
$c^2 = ?$

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

$= 22cm^2 + 15cm^2$

$c^2 = 37cm^2$

b)



Given

$c^2 = 90cm^2$ ← given longest so subtract

$a^2 = 26cm^2$

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

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

$b^2 = 90cm^2 - 26cm^2$

$b^2 = 64cm^2$

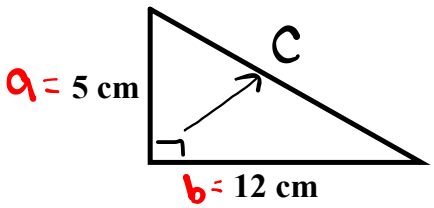
if you want side "b"

$\sqrt{b^2} = \sqrt{64cm^2}$

$b = 8cm$

Examples: Find the length of the missing side.

2a)



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

$= (5cm)^2 + (12cm)^2$

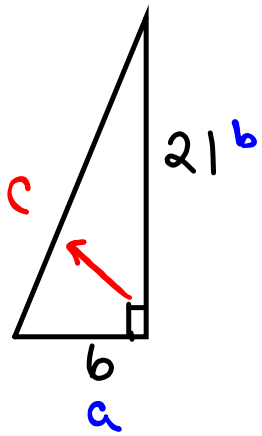
$= 25cm^2 + 144cm^2$

$c^2 = 169cm^2$

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

$c = 13cm$

2b)



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

$c^2 = (6)^2 + (21)^2$

$c^2 = 36 + 441$

$c^2 = 477$

$\sqrt{c^2} = \sqrt{477}$

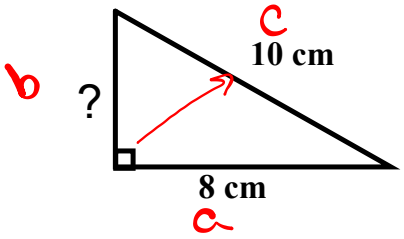
$c = \sqrt{477}$

$c \approx 21.84032$

Examples: Find the length of the missing side.

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

3a)



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

$b^2 = (10cm)^2 - (8cm)^2$

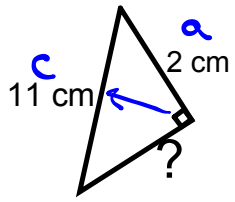
$b^2 = 100cm^2 - 64cm^2$

$b^2 = 36cm^2$

$\sqrt{b^2} = \sqrt{36cm^2}$

$\boxed{b = 6cm}$

3b)



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

$b^2 = (11cm)^2 - (2cm)^2$

$b^2 = 121cm^2 - 4cm^2$

$b^2 = 117cm^2$

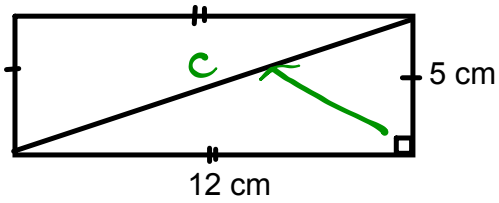
$\sqrt{b^2} = \sqrt{117cm^2}$

$b = \sqrt{117}\ cm$

or

$b \approx 10.81\ cm$

Find the length of the diagonal of the rectangle.



ADD TO YOUR NOTES

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

$c^2 = (12\text{cm})^2 + (5\text{cm})^2$

$c^2 = 144\text{cm}^2 + 25\text{cm}$

$c^2 = 169\text{cm}^2$

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

$c = 13\text{ cm}$

Class/Homework

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#3(a,b)

#4(a,b)