Warm Up Quiz Grade 8

Tuesday, Nov. 20

the quiz!
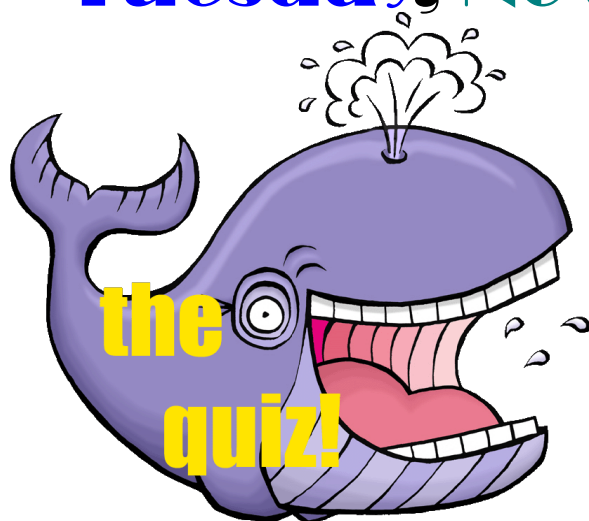
1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169
196
225

Pythagorean Theorem

a^2

a
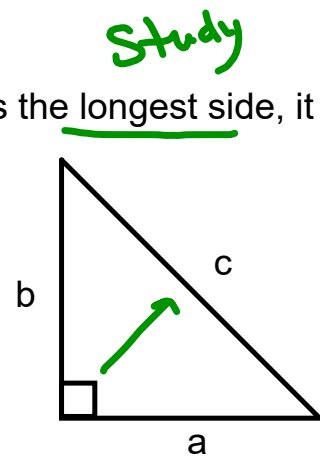
c^2

hypotenuse

c

b

b^2
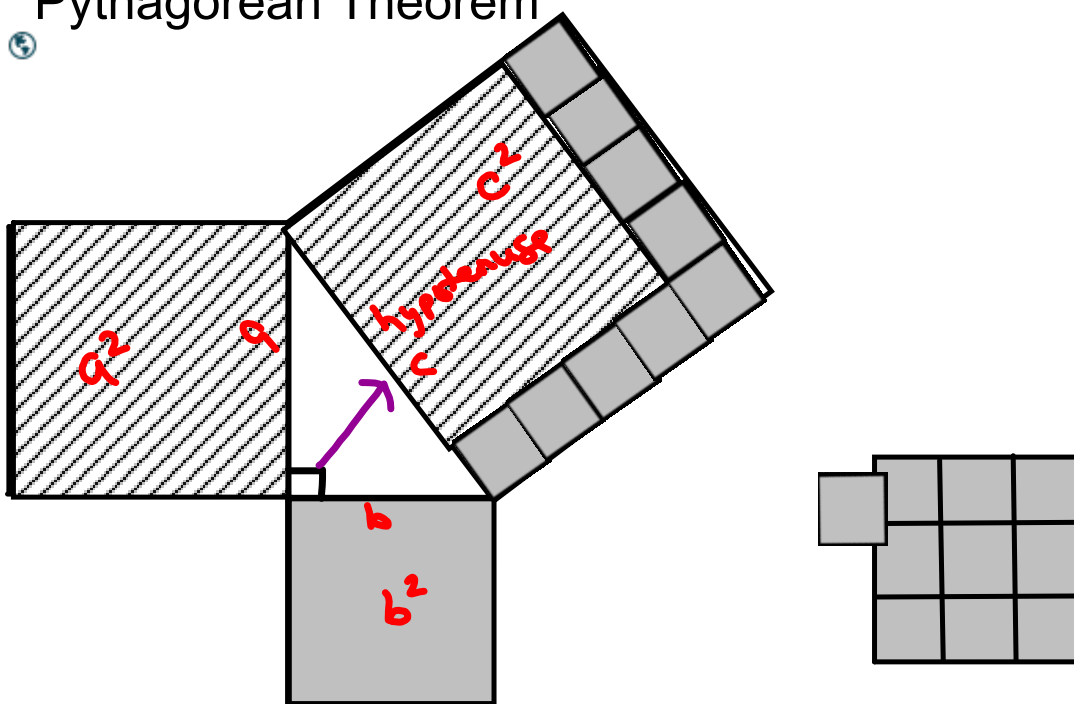
Pythagorean Theorem

- Right Angle Triangle has one angle that 90°

Study

- 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"

b   c

a

Pythagorean Theorem Equation:

Study

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

area of the square
off the hypotenuse

area
of
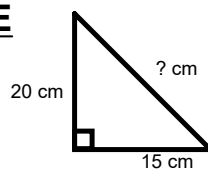square

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

area of the square
off the leg

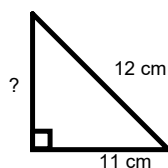## Pythagorean Theorem Equation:

Side lengths   Study

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

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

20 cm

? cm

15 cm

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

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

?

12 cm

11 cm

Example)

Find the area of the indicated square:

Given Area

a)

Area

c^2

? cm²

Area

15 cm² b

b^2

a

Area

22 cm²

a^2

b)

Area

c^2

90 cm²

Area

? cm² b

b^2 c

a

Area

26 cm²

a^2
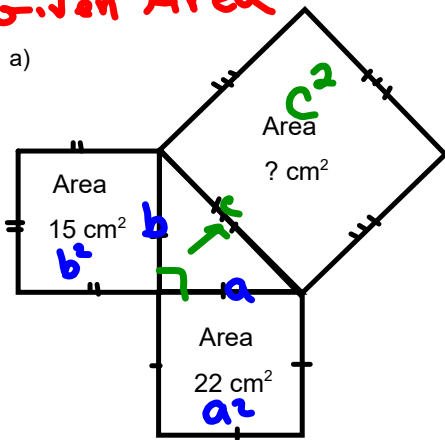
$$c^2 = a^2 + b^2$$
$$= 22cm^2 + 15cm^2$$
$$c^2 = 37cm^2$$

$$Side = \sqrt{Area}$$
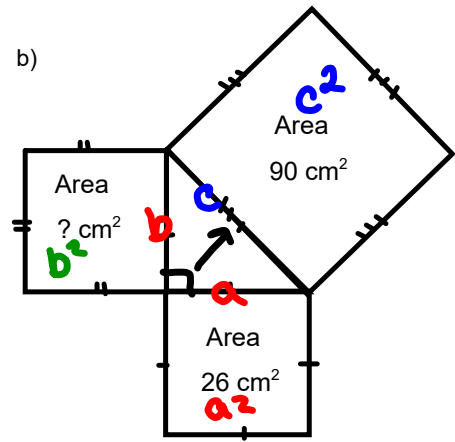
$$b^2 = c^2 - a^2$$
$$b^2 = 90cm^2 - 26cm^2$$
$$b^2 = 64\ cm^2$$

↑ area

$$Side\ b = \sqrt{64}$$
$$b = 8$$

Examples: Find the length of the missing side.

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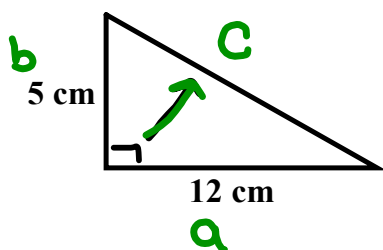
$$c^2 = a^2 + b^2$$

$$c^2 = (12cm)^2 + (5cm)^2$$
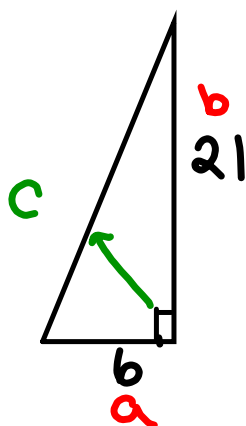
$$c^2 = 144cm^2 + 25cm^2$$

$$c^2 = 169cm^2$$

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

$$c = 13\ cm$$

2b)

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

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

$$c^2 = 36 + 441$$

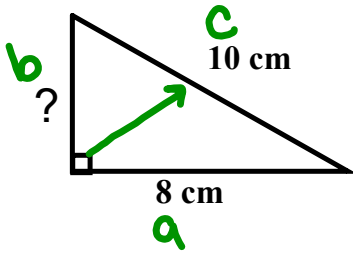$$c^2 = 477$$

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

$$c \approx 21.8$$

Examples: Find the length of the missing side.

$$C^2 = a^2 + b^2$$
$$\text{or}$$
$$b^2 = C^2 - a^2$$

3a)

b
?

C
10 cm

8 cm
a

$$b^2 = C^2 - a^2$$
$$b^2 = (10cm)^2 - (8cm)^2$$
$$b^2 = 100cm^2 - 64cm^2$$
$$b^2 = 36cm^2$$
$$\sqrt{b^2} = \sqrt{36cm^2}$$
$$b = 6\,cm$$

3b)

C
11 cm

a
2 cm

?
b
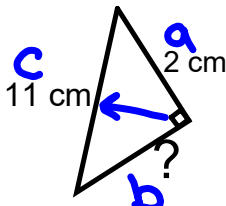
$$b^2 = C^2 - a^2$$
$$b^2 = (11)^2 - (2)^2$$
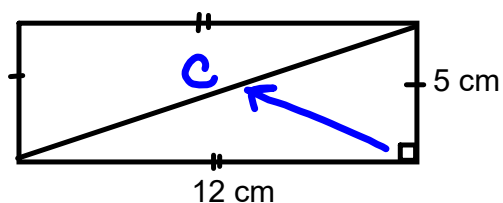$$b^2 = 121 - 4$$
$$b^2 = 117$$
$$\sqrt{b^2} = \sqrt{117}$$
$$b \approx 10.8\,cm$$

Find the length of the diagonal of the rectangle.

5 cm

12 cm

ADD TO YOUR NOTES

diagonals are hypotenuses

$$C^2 = a^2 + b^2$$
$$C^2 = (12cm)^2 + (5cm)^2$$
$$C^2 = 144 cm^2 + 25 cm^2$$
$$C^2 = 169 cm^2$$
$$\sqrt{C^2} = \sqrt{169} cm$$
$$C = 13 cm$$

Class/Homework

Page 34:

#3(a,b)

#4(a,b)