M8 - 3.0 - Pythagoras' Theorem Review

Check on Calculator!

Pythagoras' Theorem: $a^2 + b^2 = c^2$

Remember: "c" is always the Hypotenuse: the longest side

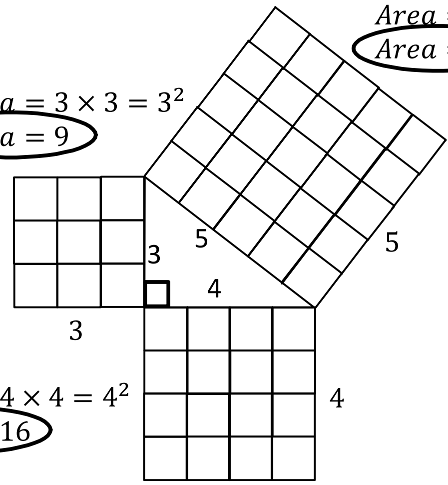
$(Right\ Angle\ 90^o\ Triangle)$

$Area = 5 \times 5 = 5^2$

$Area = 25$

$Area = 3 \times 3 = 3^2$

$Area = 9$

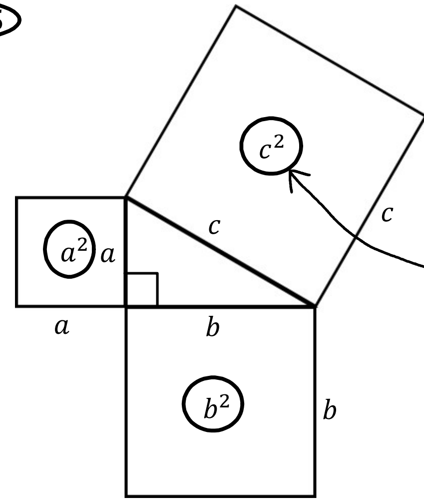


$Area = 4 \times 4 = 4^2$

$Area = 16$

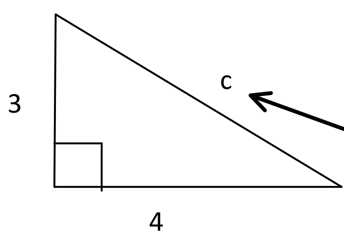
$9\ squares + 16\ squares = 25\ squares$

$\sqrt{25} = 5$



Area $= c \times c$
$= c^2$

Solve for "c".

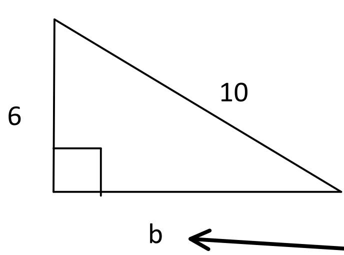


$$a^2 + b^2 = c^2$$
$$3^2 + 4^2 = c^2$$
$$9 + 16 = c^2$$
$$25 = c^2$$
$$\sqrt{25} = \sqrt{c^2}$$
$$5 = c$$

Square Root Both Sides

$$3^2 + 4^2 = 25 = 5^2$$

Solve for "a" or "b".



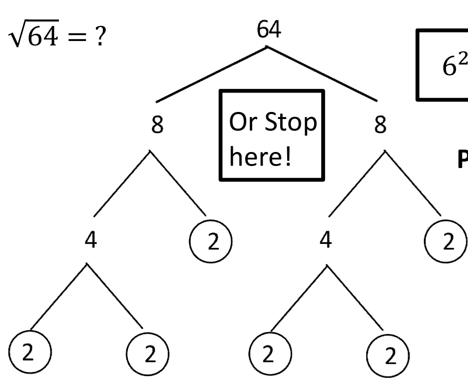
$$a^2 + b^2 = c^2$$
$$6^2 + b^2 = 10^2$$
$$36 + b^2 = 100$$
$$-36 \qquad -36$$
$$b^2 = 64$$
$$\sqrt{b^2} = \sqrt{64}$$
$$b = 8$$

Subtract Both Sides

Square Root Both Sides

$$6^2 + 8^2 = 100 = 10^2$$

$\sqrt{64} = ?$



Prime Factorization

$$\sqrt[2]{64} = \sqrt[2]{2 \times 2 \times 2 \times 2 \times 2 \times 2}$$
$$= 2 \times 2 \times 2$$
$$= 8$$

A pair of identical numbers under a square root: one of each comes out. Nothing is left.

Remember:
The Area of the two small squares adds to the area of the large square.

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

OR

Remember:
Biggest square minus smaller square equals other smaller square.

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

Left Hand Side (Of Equal Sign)

Right Hand Side (Of Equal Sign)