

Today's Learning Goal(s):

By the end of the class, I will be able to:

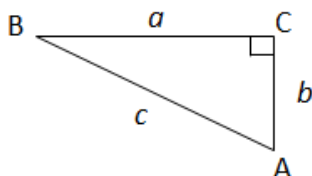
- a) Correctly write the Pythagorean Theorem (PT) for a right triangle
- b) Solve a PT equation to find the unknown length.

The Pythagorean Theorem

Date: Feb. 7 / 17

For any right triangle ABC,

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



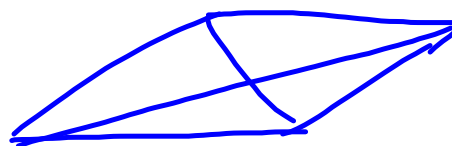
Definitions :

Right triangle – a triangle with a 90° angle

Hypotenuse – the longest side of a right triangle **AND** the side opposite the 90° angle

Leg – one of the sides in a right triangle that *form* the right angle

Diagonal – in a rectangle (parallelogram), it is the line segment from one vertex to another vertex, where the vertices are not connecting the same side of the rectangle



Ex. 1: Solve for x .

a) $\frac{2x}{2} = \frac{10}{2}$

$x = 5$

b) $x - 8 = 17$

$x = 17 + 8$

$x = 25$

c) $-5 = 3x - 8$

$-5 + 8 = 3x$

$3 = \frac{3x}{3}$

$1 = x$

d) $x^2 = 25$

$\sqrt{x^2} = \pm \sqrt{25}$

$x = \pm 5$

means

$x = 5$ or $x = -5$

e) $x^2 + 36 = 100$

$x^2 = 100 - 36$

$= 64$

$\sqrt{x^2} = \pm \sqrt{64}$

$x = 8$ or $x = -8$

f) $x^2 = 31$ (nearest tenth)

↓ (1 decimal)

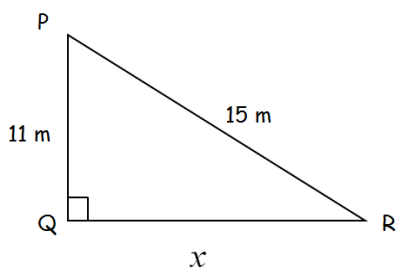
$x = \pm \sqrt{31}$

≈ 5.56

≈ 5.6

Ex. 2: Solve for x . Round your final answer to the nearest hundredth.

(This means 2 decimal places.)



The diagram is not drawn to scale.

see next page when finished

$$11^2 + x^2 = 15^2$$

$$x^2 = 15^2 - 11^2$$

$$= 225 - 121$$

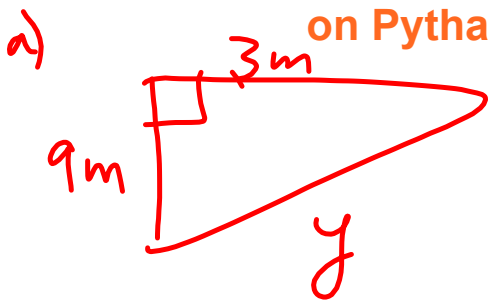
$$= 104$$

$$x = \sqrt{104}$$

$$= 10.198$$

$$= 10.20 \text{ m}$$

Quiz tomorrow
on Pythagorean Theorem.



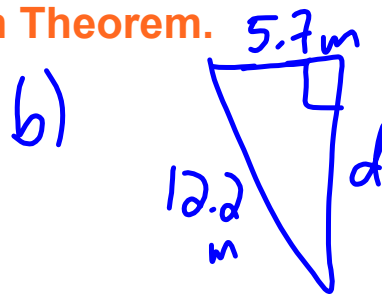
$$y^2 = 3^2 + 9^2 \quad \checkmark$$

$$= 9 + 81$$

$$= 90$$

$$y = \sqrt{90}$$

$$\doteq 9.$$



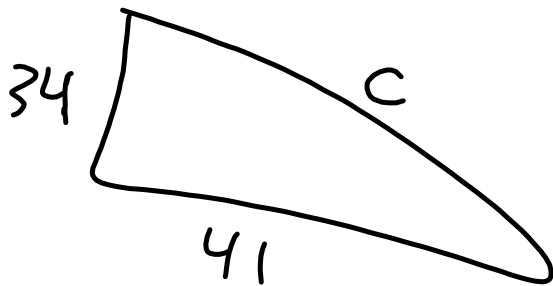
$$d^2 = 12.2^2 - 5.7^2 \quad \checkmark$$

$$= 148.84 - 32.49$$

$$= 116.35$$

$$d = \sqrt{116.35}$$

$$\doteq$$



$$\begin{aligned} \text{Long} &= 34 + 41 \\ &= 75 \end{aligned}$$

$$\text{Save} = 75 - c$$