

UNIT 1: TRIGONOMETRY

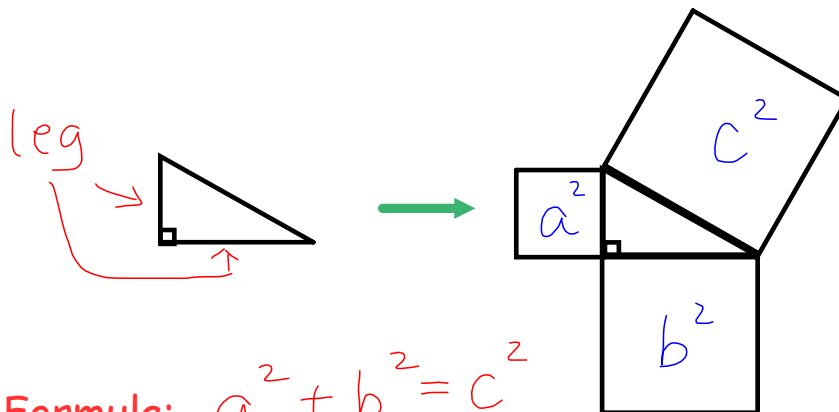
PYTHAGOREAN THEOREM AND PRIMARY TRIGONOMETRIC RATIOS

Learning Goals;

- understand the formulas used when dealing with right angled triangles

Pythagorean Theorem Review

In a right triangle, the sum of the squares of the two legs (the two sides that form the right angle) equals the square of the hypotenuse.

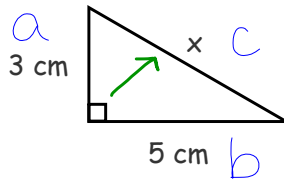


Formula: $a^2 + b^2 = c^2$

<https://www.youtube.com/watch?v=CAkMUdeB06o>



Solve for x and y.



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

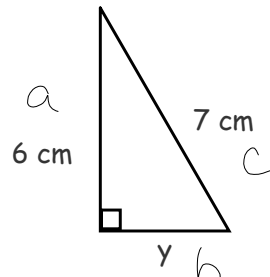
$$3^2 + 5^2 = c^2$$

$$9 + 25 = c^2$$

$$\sqrt{34} = \sqrt{c^2}$$

$$5.8 = c$$

$$\therefore c = 5.8 \text{ cm}$$



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

$$6^2 + b^2 = 7^2$$

$$36 + b^2 = 49$$

$$b^2 = 49 - 36$$

$$b^2 = 13$$

$$b = 3.6$$

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

$$b^2 = 7^2 - 6^2$$

$$b^2 = 49 - 36$$

$$b^2 = 13$$

$$b = 3.6$$

SOHCAHTOA powerpoint

Using your calculator...

1. Make sure it is set to **DEGREES**.

$$\sin 90^\circ = 1$$

2. Going **FORWARD**...Solve

$$\begin{aligned}\sin 30^\circ &= 0.5 \\ \sin 40^\circ &= 0.64 \\ \sin 120^\circ &= 0.86 \\ \sin 240^\circ &= -0.86\end{aligned}$$

⊗ sin and cos is always between -1 and 1

↖ can be negative

3. Going **BACKWARDS**...find the angle \rightarrow inverse θ

$$\sin \theta = 1$$

$$\sin^{-1}(1) = ?$$

$$\theta = 90^\circ$$

$$\cos \theta = -0.5$$

$$\theta = 120^\circ$$

$$\sin \theta = -0.5$$

$$\theta = -30^\circ$$

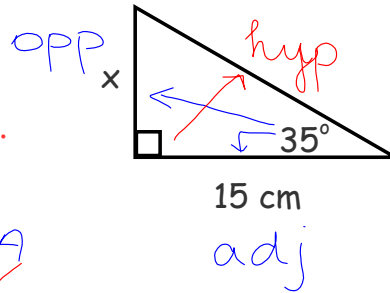
$$\cos \theta = 2$$

ERROR

Soh Cah Toa

Steps:

1. Name the sides.
2. Choose equation.
3. Substitute in numbers.
4. Solve.



SOH CAH TOA
 ✓ x ✓ x ✓ ✓
 ↑

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

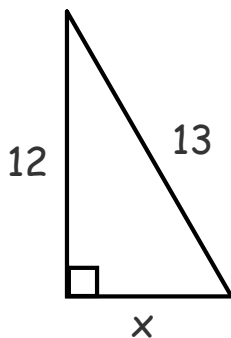
$$\tan 35^\circ = \frac{x}{15}$$

$$\tan 35^\circ (15) = \frac{x}{15} (15)$$

$$10.5 = x$$

On the Boards...

Find the missing side

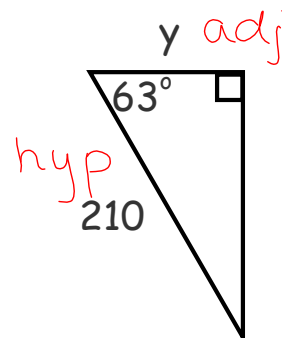


$$x^2 + 12^2 = 13^2$$

$$x^2 + 144 = 169$$

$$x^2 = 25$$

$$x = 5$$



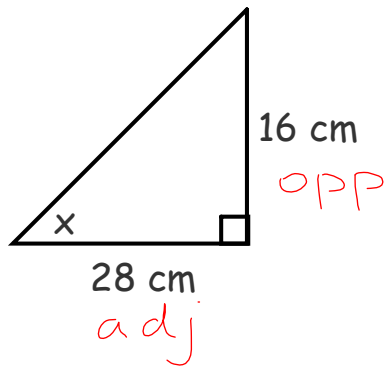
$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\cos 63^\circ = \frac{e}{210}$$

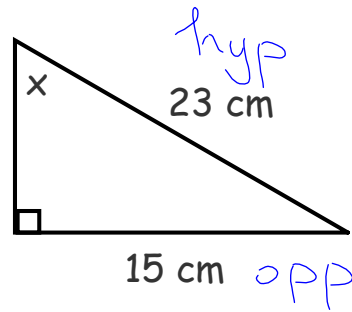
$$210 (\cos 63^\circ) = e$$

$$95.3 = e$$

Find the missing angle



$$\begin{aligned} \tan \theta &= \frac{\text{opp}}{\text{adj}} \\ \tan \theta &= \frac{16}{28} \\ \tan \theta &= 0.57 \\ \theta &= 30^\circ \end{aligned}$$



$$\begin{aligned} \sin \theta &= \frac{\text{opp}}{\text{hyp}} \\ \sin \theta &= \frac{15}{23} \\ \sin \theta &= 0.65 \\ \theta &= 41^\circ \end{aligned}$$

Multi-Triangle Trigonometry

Solve for x .

Find a

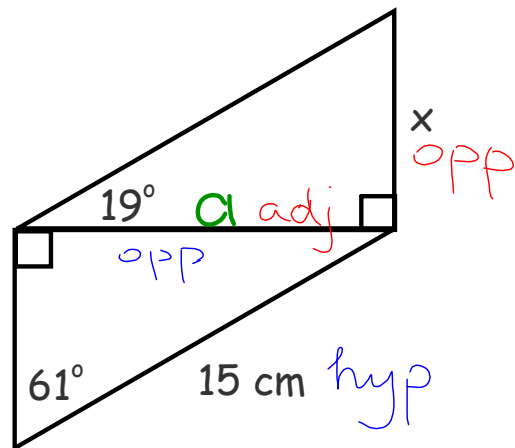
$$\sin 61^\circ = \frac{a}{15}$$

$$13.12 = a$$

Find x

$$\tan 19^\circ = \frac{x}{13.12}$$

$$4.5 = x$$



HOMEWORK HANDOUTS

Attachments

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