

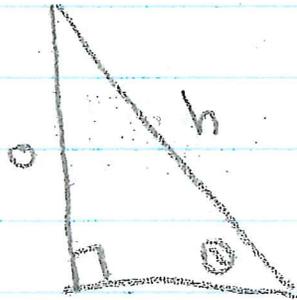
Labeling Right Triangles



- o - opposite - leg on the other side of θ
- a - adjacent - leg next to θ or angle
- h - hypotenuse - longest side, across from the 90°

Sine

SOH CAH TOA

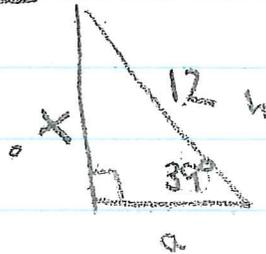


$$\sin \theta = \frac{o}{h}$$

*make sure your calc is in degrees.

Finding sides

opposite -



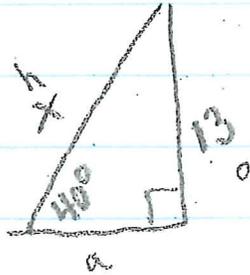
$$\sin 39 = \frac{x}{12}$$

$$12 \cdot \sin 39^\circ = \frac{x}{12} \cdot 12$$

$$x = 7.6$$

hypotenuse =

$$\sin \theta = \frac{o}{h}$$

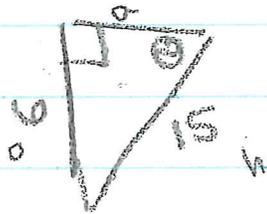


$$\sin 40^\circ = \frac{13}{x}$$

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$$x = \frac{13}{\sin 40^\circ} = 20.2$$

Finding θ



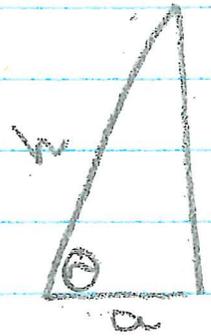
$$\sin \theta = \frac{6}{15}$$

$$\sin^{-1}(\sin \theta) = \sin^{-1}\left(\frac{6}{15}\right)$$

$$\theta = \sin^{-1}\left(\frac{6}{15}\right) = 23.6^\circ$$

Cosine

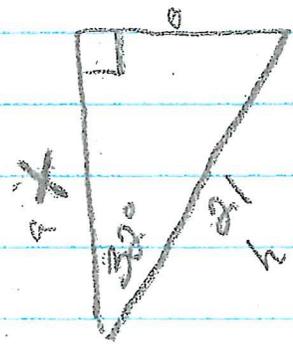
~~SOH~~ CAH TOA



$$\cos \theta = \frac{a}{h}$$

Finding sides

adjacent -



$$\cos 32 = \frac{x}{21}$$

$$21 \cdot \cos 32 = x$$

$$x = 17.8$$

hypotenuse -

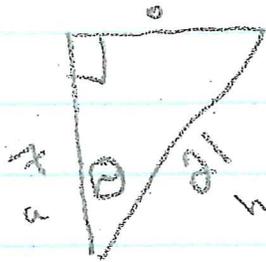


$$\cos 67 = \frac{5}{x}$$

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$$x = \frac{5}{\cos 67} = 12.8$$

Finding the angle



$$\cos \theta = \frac{7}{21}$$

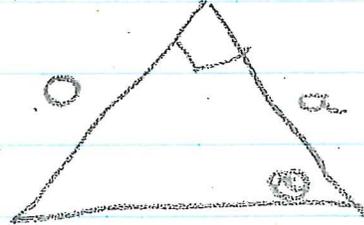
$$\cos^{-1}(\cos \theta) = \cos^{-1}\left(\frac{7}{21}\right)$$

$$\theta = \cos^{-1}\left(\frac{7}{21}\right) = 70.5^\circ$$

Tangent

~~SOH~~ ~~CAH~~ **TOA**

$$\tan \theta = \frac{o}{a}$$



Finding sides

opposite -

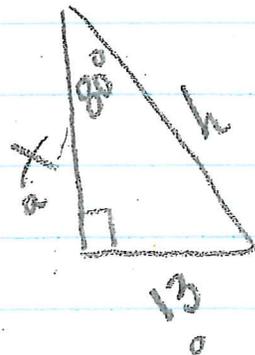


$$\tan 56^\circ = \frac{x}{7}$$

$$7 \cdot \tan 56 = \frac{x}{7}$$

$$x = 10.4$$

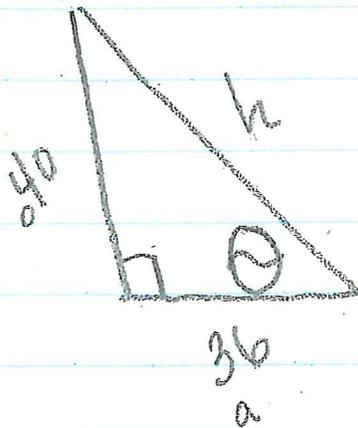
adjacent -



$$\tan 80^\circ = \frac{13}{x}$$

$$x = \frac{13}{\tan 80^\circ} = 2.3$$

Finding angles



$$\tan \theta = \frac{40}{36}$$

$$\theta = \tan^{-1}\left(\frac{40}{36}\right) = 48.0^\circ$$

When to use what trig function

① Label your triangle to see which sides you know or are looking for.

② a) opposite + hypotenuse \rightarrow sine
(o) (h) $\sin \theta = \frac{o}{h}$

b) adjacent + hypotenuse \rightarrow cosine
(a) (h) $\cos \theta = \frac{a}{h}$

c) opposite + adjacent \rightarrow tangent
(o) (a) $\tan \theta = \frac{o}{a}$