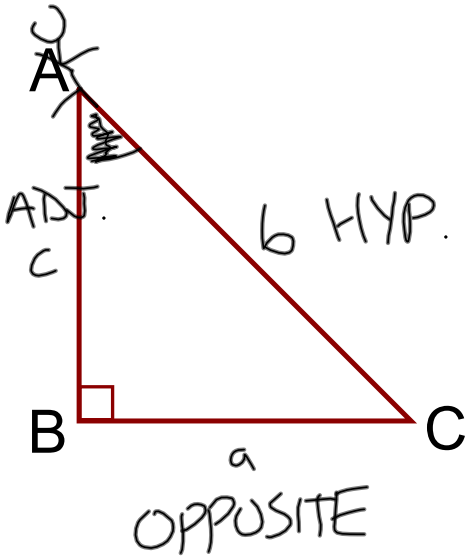
Intro to Ch.5 : Trig Review

SOH CAH TOA

$\sin = \frac{\text{Opposite}}{\text{Hypotenuse}}$ $\cos = \frac{\text{Adjacent}}{\text{Hyp.}}$ $\tan = \frac{\text{Opposite}}{\text{Adjacent}}$



SOH CAH TOA

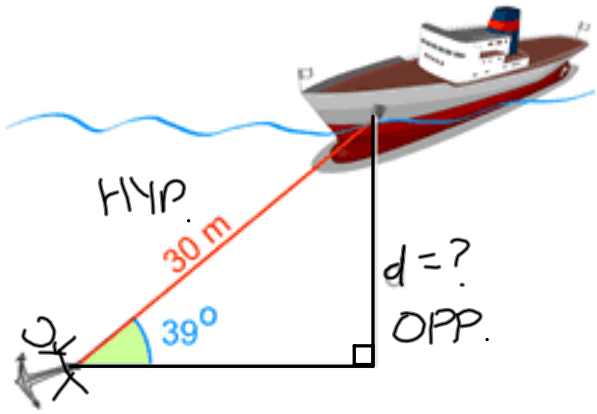
$\sin A = \frac{OPP}{HYP.} = \frac{a}{b}$

$\cos A = \frac{Adj.}{Hyp.} = \frac{c}{b}$

$\tan A = \frac{OPP}{ADJ.} = \frac{a}{c}$

$\sin A = \frac{6}{10}$

$A = \sin^{-1}\left(\frac{6}{10}\right)$



SOH CAH TOA

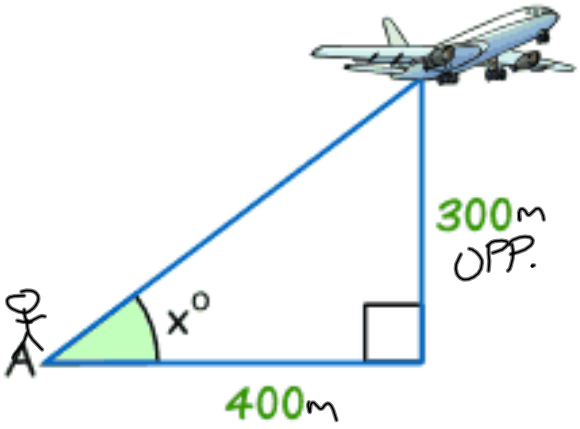
$$\frac{OPP}{HYP} = \sin A$$

$$\frac{d}{30} = \sin(39°)$$

$$d = 30 \times (\sin(39°))$$

$$d = 30(0.6293)$$

$$d = 18.88m$$



$$\tan A = \frac{OPP}{ADJ.}$$

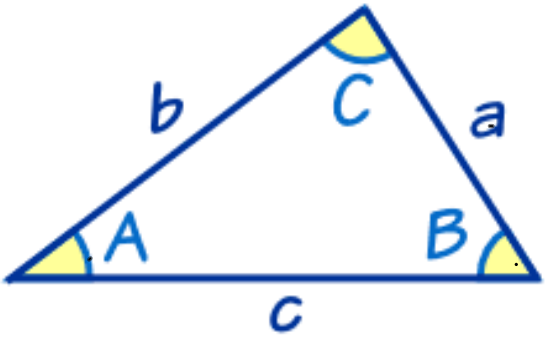
$$\tan(x°) = \frac{300}{400} = 0.75$$

$$\tan X = 0.75$$

$$X = \tan^{-1}(0.75)$$

$$X = 36.87°$$

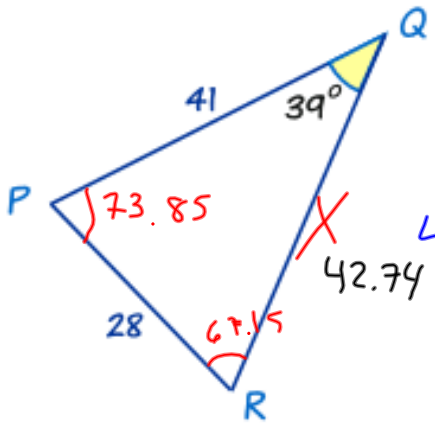
Sine Law



$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

Find all the angles
Find all the side lengths.

Solve the following triangle using sine law:



$$\frac{\sin(39°)}{28} = \frac{\sin R}{41}$$

$$41 \times \sin(39°) = 28 \sin R$$

$$\frac{25.8021}{28} = \frac{28 \sin R}{28}$$

$$0.9215 = \sin R$$

looking for an angle so I use inverse of sin.

$$R = \sin^{-1}(0.9215)$$

$$R = 67.15°$$

$$P = 180° - 39 - 67.15$$

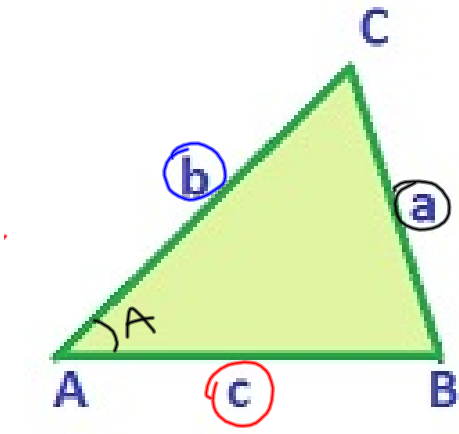
$$P = 73.85°$$

$$\frac{\sin(39)}{28} = \frac{\sin(73.85)}{X}$$

$$X \sin(39) = 28 \sin(73.85)$$

$$X = \frac{28 \sin(73.85)}{\sin(39)} = 42.74m$$

Cosine Law



$a^2 = b^2 + c^2 - 2bc\cos A$

$b^2 = a^2 + c^2 - 2ac\cdot\cos B$

$c^2 = a^2 + b^2 - 2ab\cos C$

$a^2 = b^2 + c^2 - 2bc\cos A$

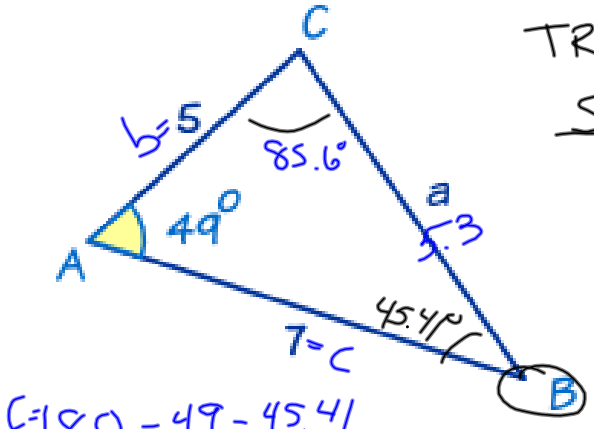
$\frac{a^2 - b^2 - c^2}{-2bc} = \frac{-2bc(\cos A)}{-2bc}$

$\frac{-a^2 + b^2 + c^2}{2bc} = \cos A$ $\quad A = \cos^{-1}(0.6875)$

$0.6875 = \cos A \Rightarrow A = 46.57^\circ$

ex:

Solve the following triangle using cosine law



TRIED TO USE SINE LAW:

$\frac{\sin 49}{a} = \frac{\sin B}{5}$

$a^2 = 5^2 + 7^2 - 2(5)(7)\cos(49^\circ)$

$a^2 = 25 + 49 - 45.9241$

$a^2 = 28.0759$

$a = \sqrt{28.0759} = 5.3 \text{ units}$

$C = 180 - 49 - 45.41$

$C = 85.6^\circ$

$b^2 = a^2 + c^2 - 2ac\cos B$

$5^2 = (5.3)^2 + 7^2 - 2(5.3)(7)\cos B$

$25 = 77.09 - 74.2\cos B$

$25 - 77.09 = -74.2\cos B$

$\frac{-52.09}{-74.2} = \frac{-74.2\cos B}{-74.2}$

$0.7020 = \cos B$

$B = \cos^{-1}(0.7020) = 45.41^\circ$