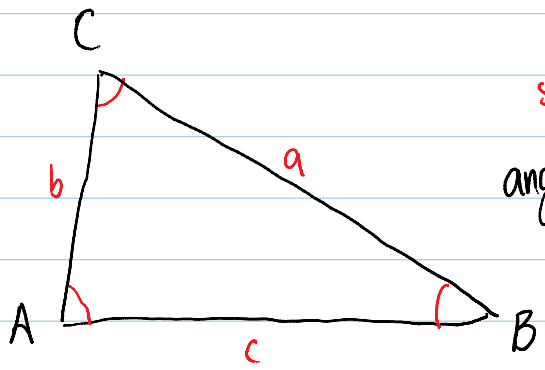
3.2 Applying the Sine Law

February-25-14
9:30 AM

The sine law can be used to determine unknown side lengths or angle measures in acute triangle

Sine Law



In any acute triangle

sides → $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ ← angles

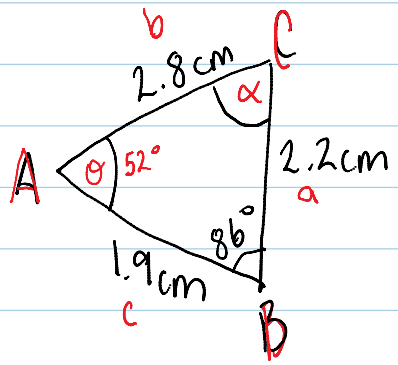
#use when determining side lengths!

#when determining angles, its more convenient to use:

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

Ex #1

Find θ and ∝ unknown angles



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

$$\frac{\sin A}{2.2} = \frac{\sin 86°}{2.8}$$

#

$$\sin A = \frac{(2.2)(\sin 86°)}{2.8}$$

$$\sin A = (0.78)$$

$$A = \sin^{-1}(0.78)$$

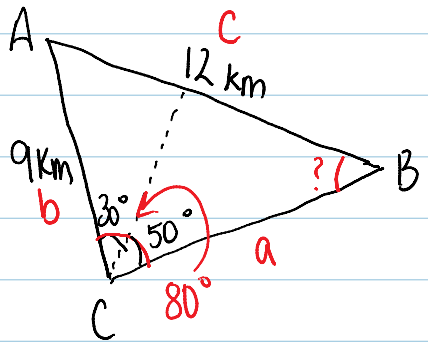
$A = \sin^{-1}(0.78)$

$= 51.6^\circ \approx \boxed{52^\circ}$

$180^\circ - 52^\circ - 86^\circ$

$= \boxed{42^\circ}$

Ex. #2 Solve $\angle B$?



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

$$\frac{\sin B}{9} = \frac{\sin 80^\circ}{12}$$

$$\sin B = \frac{9 \cdot \sin 80^\circ}{12}$$

$\sin B = 0.7386$

$B = \sin^{-1}(0.7386)$

$= 47.6 \approx \boxed{48^\circ}$

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