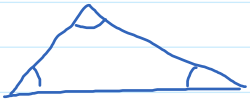
3.1 Exploring Side-Angle Relationships in Acute Triangles

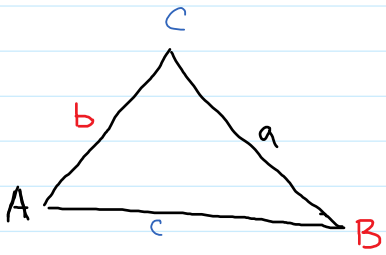
February 15, 2016 8:36 AM



Acute Triangle has interior angles less than 90°

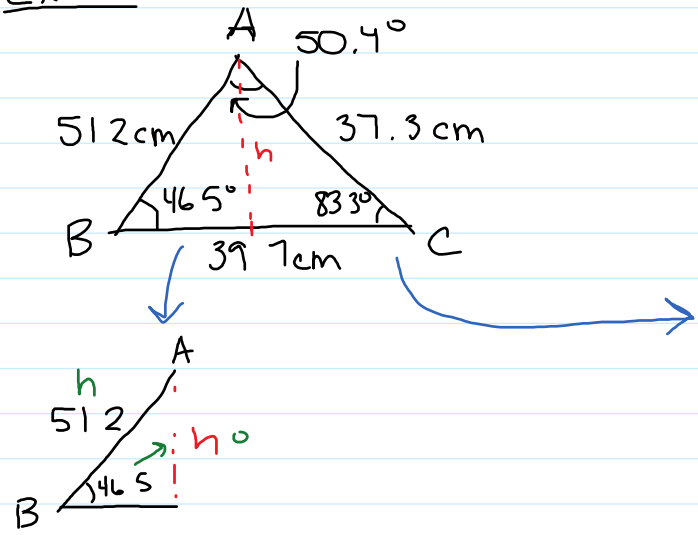
* no ∟ angles

In an acute triangle, $\triangle ABC$,



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

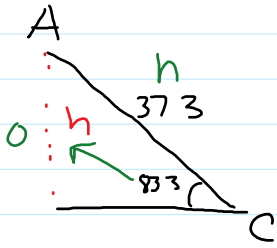
Ex #1



$\sin 46.5 = \frac{h}{51.2}$

$51.2 \cdot \sin 46.5 = h$

$37.4 = h$

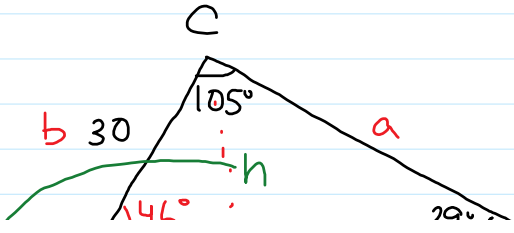


$\sin 83.3° = \frac{h}{37.3}$

$37.3 \cdot \sin 83.3 = h$

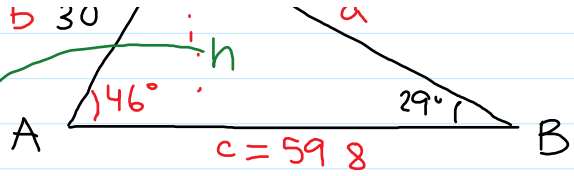
$37.04 = h$

Ex. #2 Solve $\triangle ABC$



Formula

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

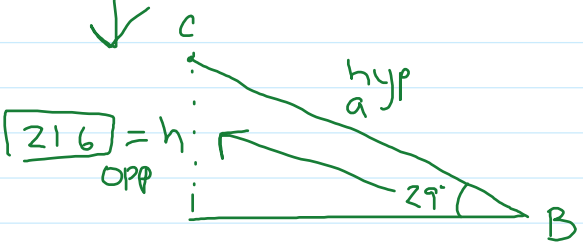


$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

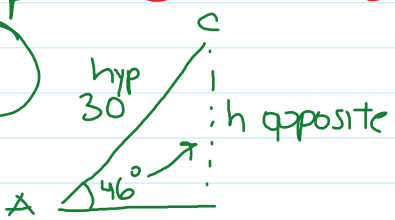
$$\frac{\sin B}{b} = \frac{\sin C}{c} \Rightarrow \frac{\sin 29^\circ}{30} = \frac{\sin 105^\circ}{c}$$

$$\frac{c \cdot \sin 29^\circ}{\sin 29^\circ} = \frac{30 \cdot \sin 105^\circ}{\sin 29^\circ}$$

$c = 59\ 8$



Step 1



$$\sin 29^\circ = \frac{21.6}{hyp}$$

$$hyp = 44.6 \text{ cm}$$

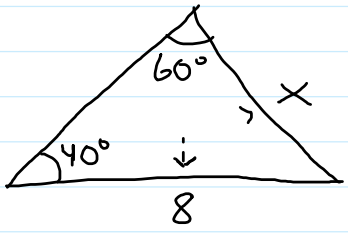
$$\sin 46^\circ = \frac{h}{30}$$

$$h = 21\ 6 \text{ cm}$$

Ex #3 Sketch a triangle that corresponds to each equation and solve for x

$$\frac{x}{\sin 40^\circ} = \frac{8}{\sin 60^\circ} \Rightarrow \frac{\sin 60^\circ}{\sin 60^\circ} x = \frac{8 \cdot \sin 40^\circ}{\sin 60^\circ}$$

$$x = 5\ 9$$



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