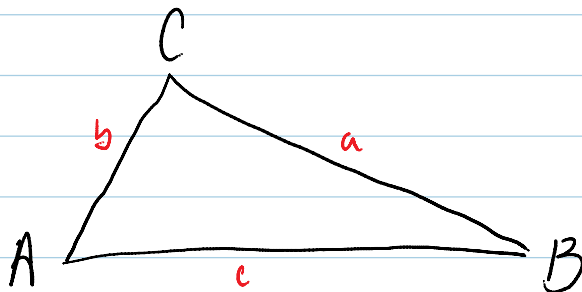


3.3 Proving & Applying the Cosine Law

February-27-14
9:29 AM

The **cosine** law can be used to determine an unknown side length or angle measure in an acute triangle



Formulas:

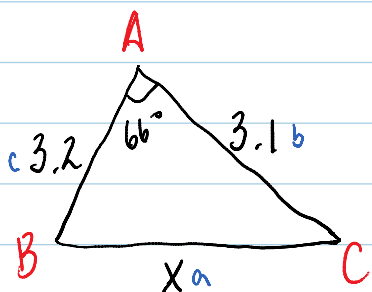
$$a^2 = b^2 + c^2 - 2bc \cdot \cos A$$

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

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

Ex. #1

(a.)



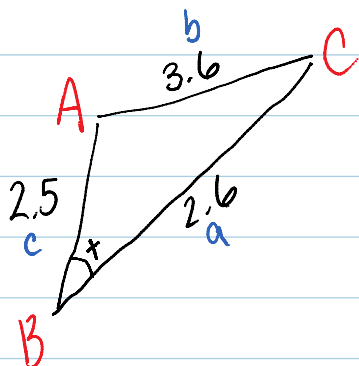
$$a^2 = b^2 + c^2 - 2bc \cdot \cos A$$

$$= 3.1^2 + 3.2^2 - 2(3.1)(3.2) \cdot \cos 66^\circ$$

$$\sqrt{a^2} = \sqrt{11.7}$$

$$a = \boxed{3.4}$$

(b.)



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

$$3.6^2 = 2.6^2 + 2.5^2 - 2(2.6)(2.5) \cdot \cos B$$

$$12.96 = 13.01 - 13 \cdot \cos B$$

$$\begin{array}{r} -13.01 \\ \hline -0.05 = -13 \cdot \cos B \\ \hline -13 \end{array}$$

$$\cos B = \frac{0.05}{13}$$

$$\begin{aligned} 0.0038 &= \cos B \\ \cos^{-1}(0.0038) &= B \\ 89.7^\circ &= B \end{aligned}$$

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