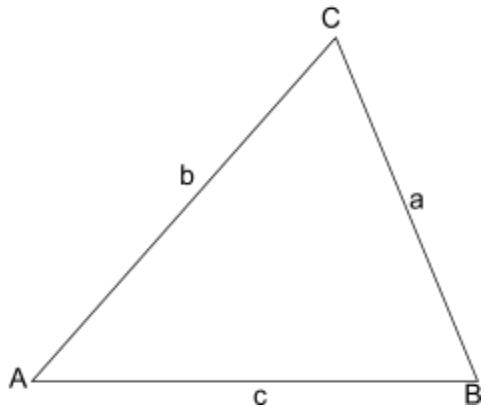


## 6-2 THE LAW OF COSINES

The Law of Cosines:  $a^2 = b^2 + c^2 - 2bc \cos A$

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

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



Hint: label vertices with capital letters and sides with lower case letters

Hint: label the side across from each angle with the same letter

Hint: check the mode of your calculator before you start

Hint: Solve for largest angle first if possible

Example 1: Solve triangle ABC

$$a = 8$$

$$b = 14$$

$$c = 19$$

$$19^2 = 14^2 + 8^2 - 2 \cdot 14 \cdot 8 \cdot \cos C$$

$$361 = 196 + 64 - 224 \cdot \cos C$$

$$361 = 260 - 224 \cdot \cos C$$

$$101 = -224 \cdot \cos C$$

$$-\frac{101}{224} = \cos C$$

$$C = \cos^{-1}\left(-\frac{101}{224}\right) \approx 116.8^\circ$$

You can use the Law of Sines or Law of Cosines to find the remaining angles.

$$\frac{\sin 116.8^\circ}{19} = \frac{\sin B}{14} \rightarrow B \approx 41.1^\circ, A \approx 22.1^\circ \text{ since the three angles must equal } 180^\circ$$

**Try one:**

Example 2: Solve triangle ABC     $a = 80$      $c = 60$      $B = 165^\circ$

Homework: p.421 #1-19 odds