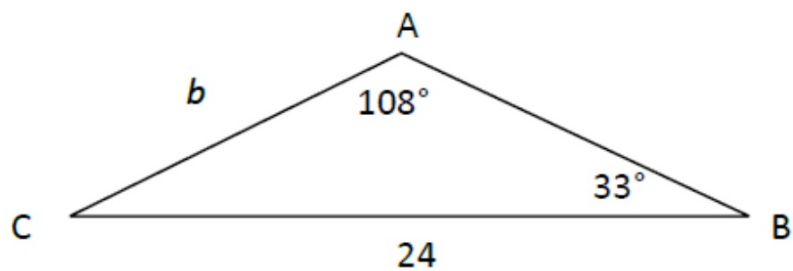


## Warm - Up

Find the length of  $b$ .

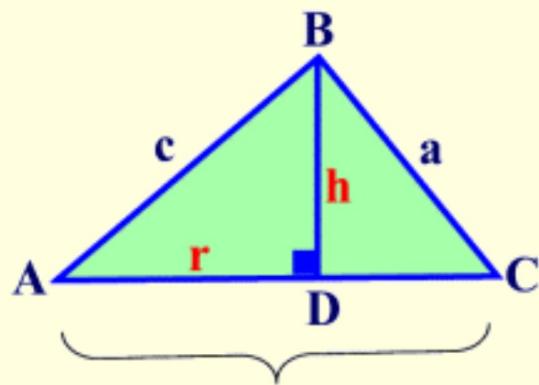


For  $\triangle ABC$ ,  $a = 8$ ,  $b = 10$ , and  $m\angle A = 34^\circ$ . Find all the possible  $m\angle B$  to the nearest whole degree

SWBAT derive the formula for the law of cosines

SWBAT use the law of cosines to find missing sides and angles.

**Law of Cosines**



This same process could be used to produce other lettered statements of this law.

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

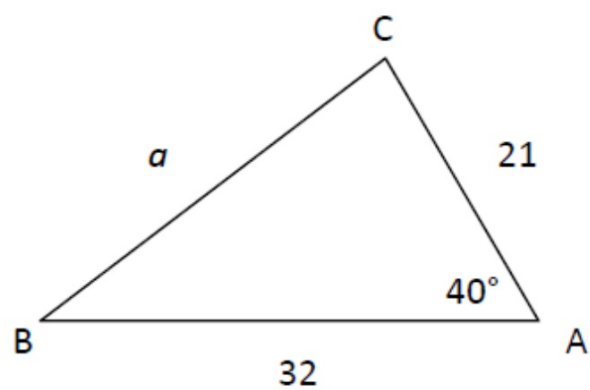
$$c^2 = a^2 + b^2 - 2ab \cos C$$

**Law of Cosines:**  $c^2 = a^2 + b^2 - 2ab \cos C$

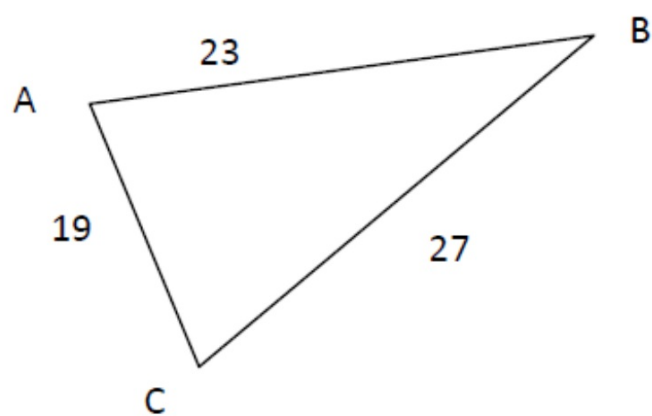
*A generalization of the Pythagorean Theorem. If angle C were a right angle, the cosine of angle C would be zero and the Pythagorean Theorem would result.*

*Example 1:*

**Find the length of  $a$ .**

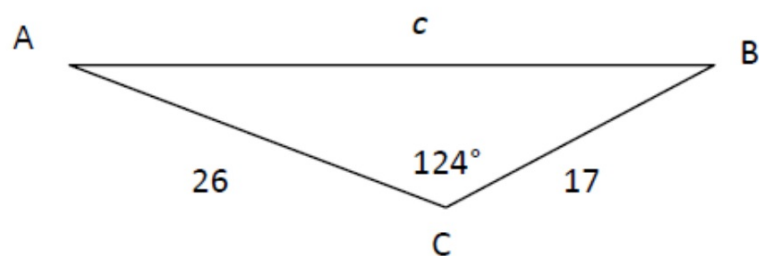


*Example 2:*  
**Find  $m\angle A$ .**



*Example 3:*

**For  $\triangle ABC$ , find the length of  $c$  given  $a = 17$ ,  $b = 26$ , and  $m\angle C = 124^\circ$ .  
Draw and label a triangle.**



## Exit Card

For  $\triangle ABC$  find  $m\angle B$  to the nearest tenth of a degree.

