

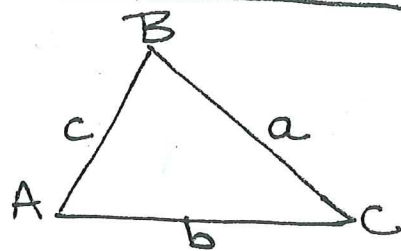
8-7 Law of Cosines

The law of Cosines allows us to solve for triangles when law of sines cannot be used.

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

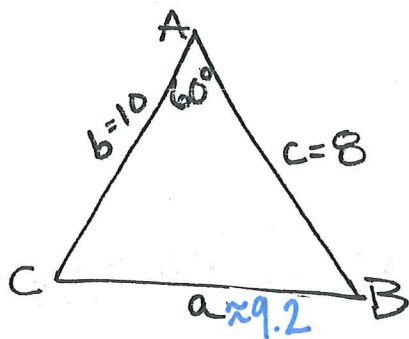
$$b^2 = a^2 + c^2 - 2ac \cdot \cos B$$

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



ex 1:

If $c=8$, $b=10$, and $m\angle A=60^\circ$, find a.



↑ determines
which form
to use

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

$$a^2 = 10^2 + 8^2 - 2(10)(8) \cos 60^\circ$$

$$a^2 = 10^2 + 8^2 - 160 \cos 60^\circ$$

$$a^2 = 100 + 64 - 80$$

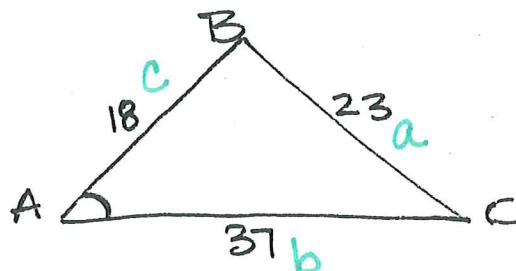
$$a^2 = 84$$

$$\sqrt{a^2} = \sqrt{84}$$

$$a \approx 9.2$$

ex. 2:

Find $m\angle A$.



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

$$23^2 = 37^2 + 18^2 - 2(37)(18) \cdot \cos A$$

$$529 = 1369 + 324 - (1332 \cdot \cos A)$$

$$529 = 1693 - (1332 \cdot \cos A)$$
$$-1693 \quad -1693$$

$$\frac{-1164}{-1332} = \frac{-1332 \cdot \cos A}{-1332}$$

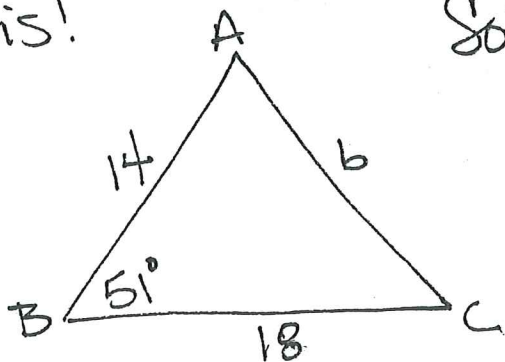
$$.8739 = \cos A$$

$$\cos^{-1}(.8739) = \cos^{-1}(\cos A)$$

$$A = 29.1 \approx 29^\circ$$

see chart on page 480 to help choose best method for solving triangles.

try this!



Solve for b.