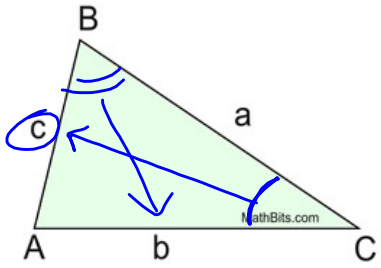


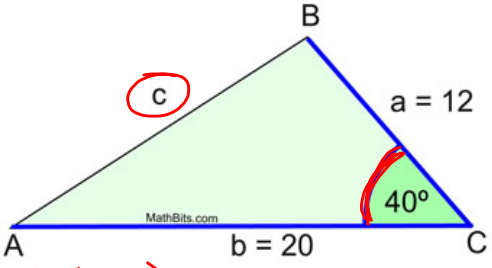
Law of Cosines

$$c^2 = a^2 + b^2 - 2ab\cos C$$
$$b^2 = a^2 + c^2 - 2ac\cos B$$
$$a^2 = b^2 + c^2 - 2bc\cos A$$

NOTICE:
Law of Cosines uses ONE angle and 3 sides.

In ΔABC, m$\angle C = 40°$, a = 12, and b = 20.

Find side c to the *nearest integer*.



$c^2 = (12)^2 + (20)^2 - 2(12)(20)\cdot\cos 40$

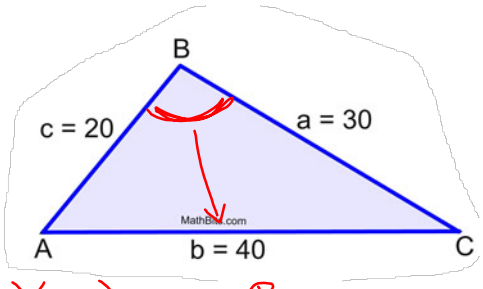
$\sqrt{c^2} = \sqrt{176.2986\ldots}$

$c = 13.2777\ldots$

$\boxed{13}$

In ΔABC, a = 30, b = 40, and c = 20.

Find the number of degrees in the largest angle (to the nearest degree).



$40^2 = (20)^2 + (30)^2 - 2(20)(30)\cdot\cos B$

$1600 = 1300 - 1200\cos B$

$-1300 \quad -1300$

$\frac{300}{-1200} = \frac{-1200(\cos B)}{-1200}$

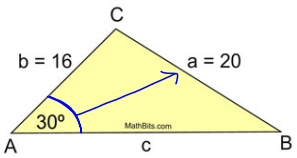
$-\frac{300}{1200} = \cos B \rightarrow \cos^{-1}\left(-\frac{300}{1200}\right)$

$m\angle B = 104.4775\ldots$

$\boxed{104^\circ}$

In ΔABC, $m\angle A = 30^\circ$, a = 20, and b = 16.

Find c.



$20^2 = (16)^2 + c^2 - 2(16)(c)\cdot\cos 30$

$400 = 256 + c^2 - 27.7128c$

$-400 \quad -400$

(a) (b) (c)

$1c^2 - 27.7128c - 144 = 0$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$x = \frac{27.7128 \pm \sqrt{(-27.7128)^2 - 4(1)(-144)}}{2(1)}$

$x = \frac{27.7128 \pm \sqrt{1343.9992}}{2}$

$\frac{27.7128 + \sqrt{1343.9992}}{2}$, $\frac{27.7128 - \sqrt{1343.9992}}{2}$

31.8942

$\boxed{32}$