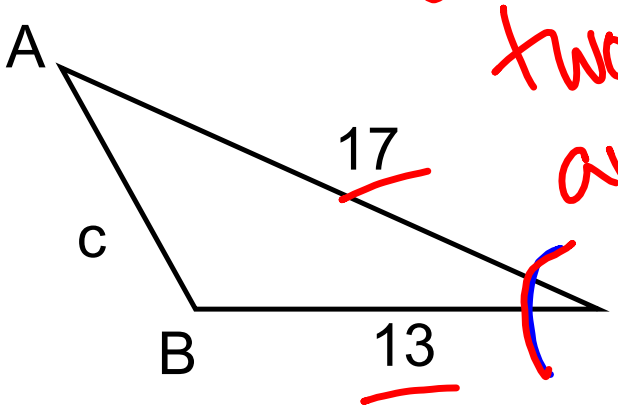
7-3 Law of Cosines

Objective:

7-3a: I can solve a triangle using the Law of Cosines.

What if...?!

Solve the triangle.



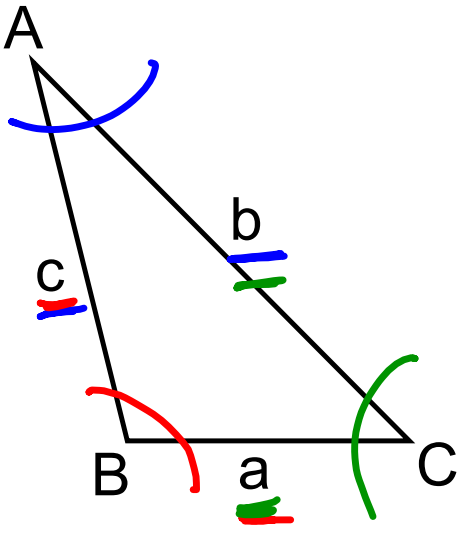
Law of Cosines – two sides and angle in between

Law of Cosines

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

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

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

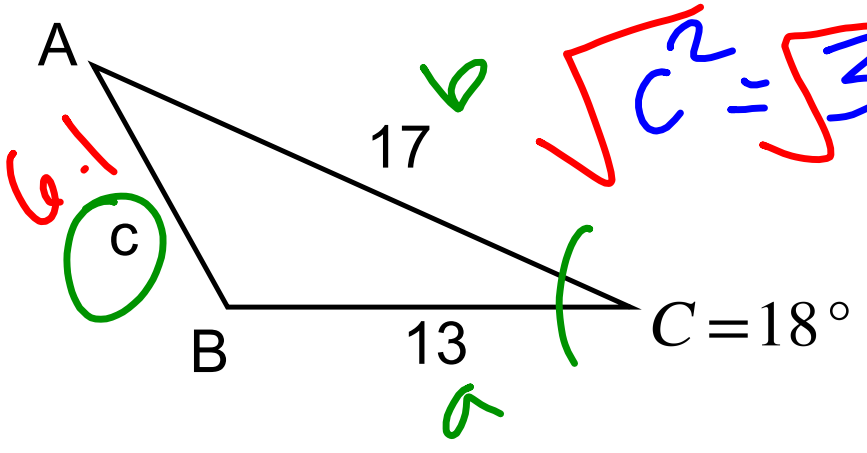


Solve the triangle.

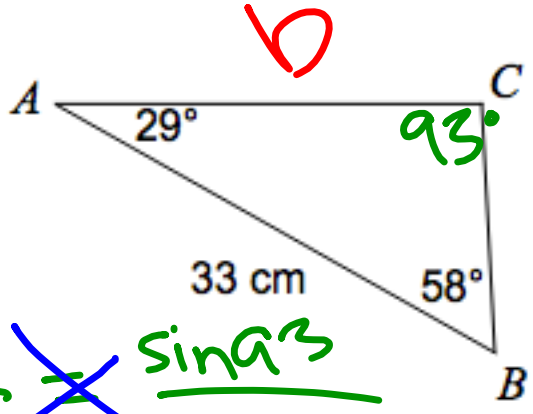
$c^2 = 13^2 + 17^2 - 2(13)(17)\cos 18$

$\sqrt{c^2} = \sqrt{37.6}$

$c = 6.1$



Solve for side b

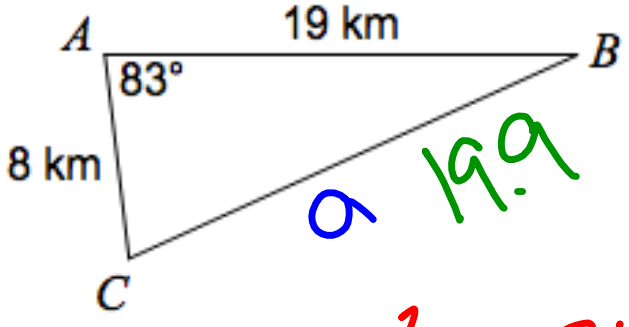


$$\frac{\sin 58}{b} = \frac{\sin 93}{33}$$

$$\frac{27.9}{0.99} = \frac{b \cdot 0.99}{0.99}$$

$$28 = b$$

Solve for side a



or 19.9

$a^2 = 8^2 + 19^2 - 2(8)(19)\cos 83$

$\sqrt{a^2} = \sqrt{384}$

The people of Myrupville need to build a bridge across Myrupville Bay. They plan to have it go from the Lighthouse on one side of the bay to the Heavyhouse on the other side of the bay. How long does the Mathgate Bridge need to be? What angles the "Houses" make with Myrupville?