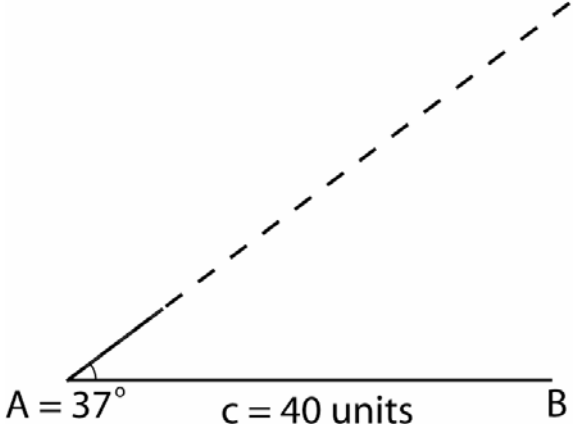
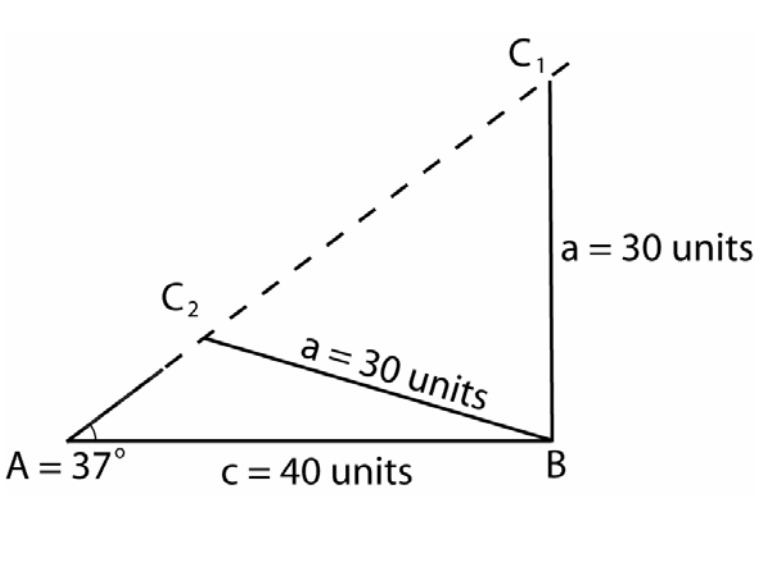


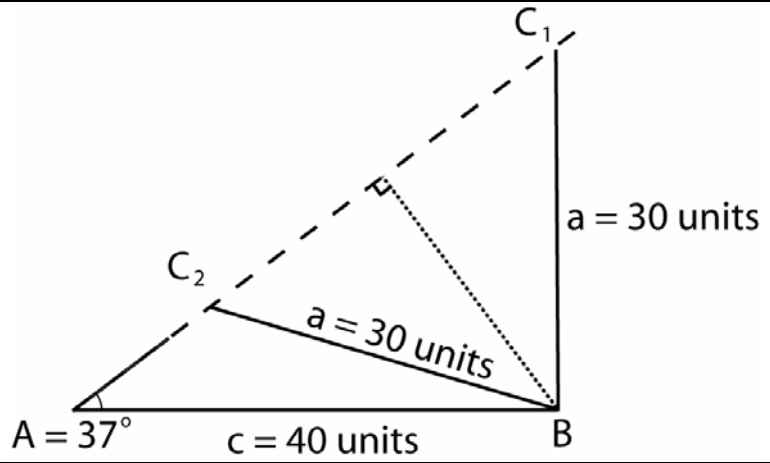
Two possible triangles:
 A deeper look at the Law of Sines

Consider the following problem.

Sketch and solve the triangle with $a = 30$, $c = 40$, and $\angle A = 37^\circ$.

<p>The picture to the right has the side c and the angle A drawn in. The side b is drawn as a dashed line since I do not know its length.</p>	 <p>A diagram showing a triangle with vertex A at the bottom left. The angle at A is labeled $A = 37^\circ$. The side opposite A is labeled $c = 40$ units. The side opposite B is a dashed line extending from vertex B.</p>
<p>We then draw in side a with a length of 30 units. Notice this side could be drawn in two different positions, resulting in two possibilities for this triangle. The two possible triangles are ABC_1 and ABC_2.</p> <p>When we solve this triangle with the information given, we must take these two possibilities into account and solve them both separately.</p>	 <p>A diagram showing two possible triangles sharing a common base AB. The angle at A is $A = 37^\circ$ and the side opposite A is $c = 40$ units. Two positions for side $a = 30$ units are shown: one as a solid line forming triangle ABC_2 and one as a dashed line forming triangle ABC_1. The vertices C_1 and C_2 are labeled.</p>

Here, I drew in the perpendicular segment from angle B to side b (dotted line). Notice the triangle C_1BC_2 is an isosceles triangle with this dotted line as its perpendicular bisector. This helps you draw it yourself.



Try to solve the triangle for the two different possibilities.