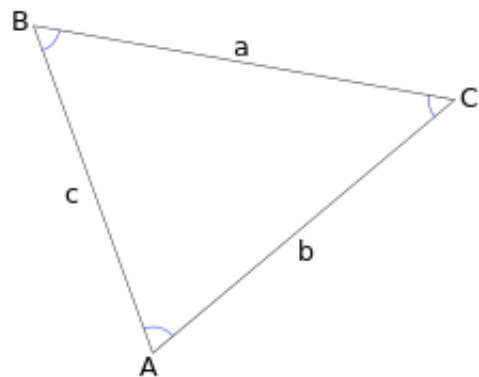


Math 229: Solving Triangles Summary and Ambiguous Case

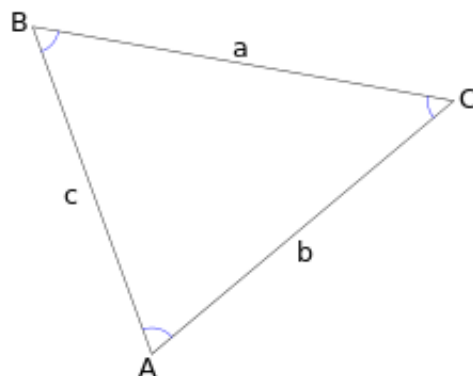
Law of Sines

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

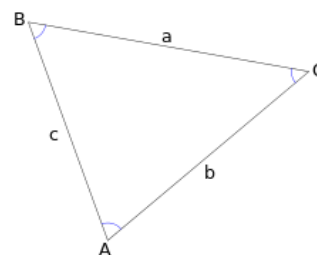


Law of Cosines

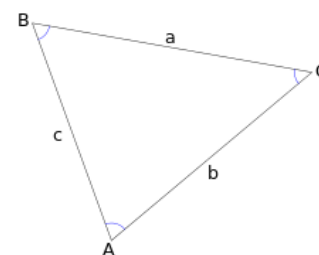
$$c^2 = a^2 + b^2 - 2ab \cos(C)$$



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



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



General approach: Sketch triangle somewhat to scale and label it the given information. Next, identify the case you're dealing with as listed below.

Case		Method
AAA	<i>angle-angle-angle</i> This case cannot be solved because knowing all three angles does not determine a unique triangle. There are an infinite number of similar triangles that share the same angles.	None...there are infinitely many solutions!
AAS	Two angles are known. <i>angle-angle-side</i> A unique triangle can be determined	Law of Sines
ASA	<i>angle-side-angle</i> A unique triangle can be determined	
SAS	Only one angle is known <i>side-angle-side</i> A unique triangle can be determined	Law of Cosines
SSS	No angles are known <i>side-side--side</i> A unique triangle can be determined	
ASS	Only one angle is known <i>angle-side-side</i> AMBIGUOUS CASE <ul style="list-style-type: none"> If the angle is obtuse, then there can be 1 solution or no solution. If angle is acute, then there can 2 solutions, 1 solution (right triangle), or no solutions 	Law of Sines

More on ASS: How to sketch these specific triangles

1. Sketch the horizontal base (unknown side so any length will do)
2. Sketch the angle using the angle info
3. Sketch the side ADJACENT to the given angle (you already started this in Step 2)
4. Sketch the OPPOSITE side, to the given angle, roughly to scale.
5. Solve for the angle that corresponds to the ADJACENT side, using the Law of Sines.

Determine whether there is one, two, or no solutions.