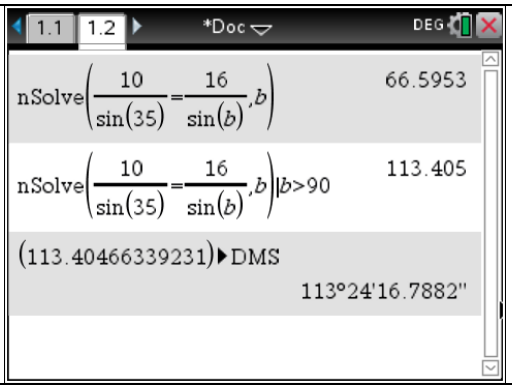
Using 'nSolve' in Sine Rule problems for non-right angle triangles.

The use of Solve command is particularly useful with the ambiguous case of the sine rule, and also eliminates the need to rearrange formulas.

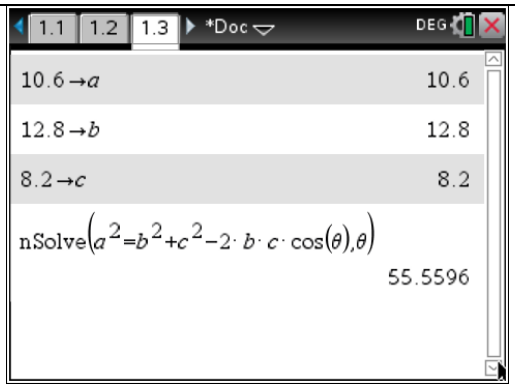
If using 'Solve' to find the size of an angle, you need to specify the minimum and maximum possible size of the angle. For a non-right angled triangle, this will be $0^o \le \theta \le 180^o$. However, with numerical solve you need to do it twice as shown in the screen shot below. Make sure your calculator is set in Degrees.

Example 1: Consider the non-right angled triangle with $a = 10, b = 16$ *and* $A = 35^o$. Find the two possible values of angle *B*, to the nearest minute.

We need to use the sine rule $\frac{a}{\sin A} = \frac{b}{\sin B}$ And then use numerical solve twice as shown.	

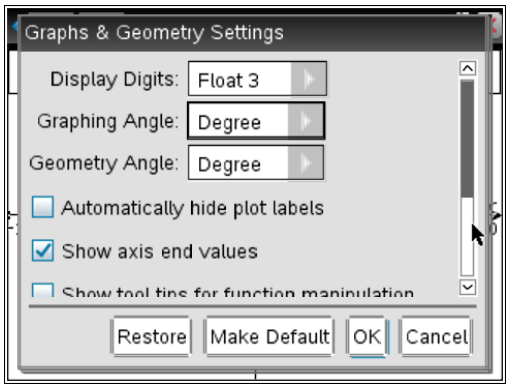
Using 'nSolve' in Cosine Rule problems for non-right angle triangles.

Example 2: Consider the non-right angled triangle with $a = 10.6,\ b = 12.8$ *and* $c = 8.2$. Find the size of angle *A*, correct to one decimal place.

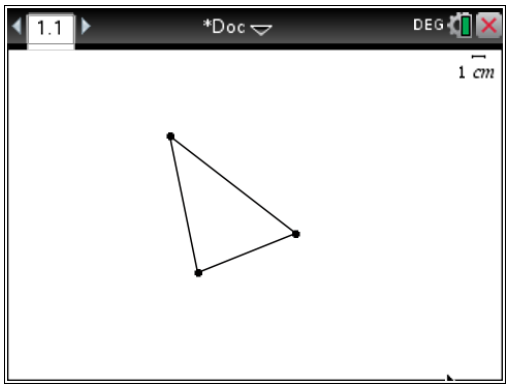
Use the cosine rule $a^2 = b^2 + c^2 - 2 \times b \times c \times \cos\theta$ **Note:** You cannot use $\cos A$; has to be a different variable such as θ. The calculator will not distinguish between *a* and *A*. Remember about 'times' sign between the pronumerals!	

Sine rule in Geometry Page

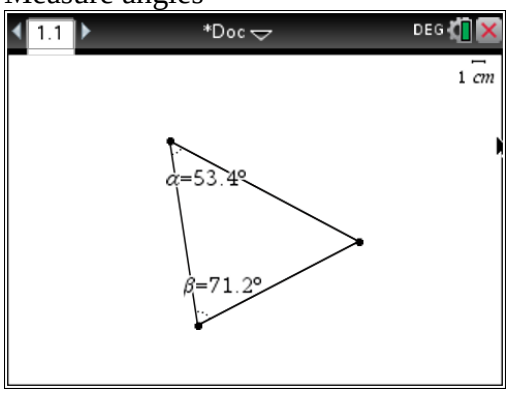
Open a new Graph screen. Then select Menu, Settings and set Graphing Angle and Geometry Angle to Degree, press OK as shown below.



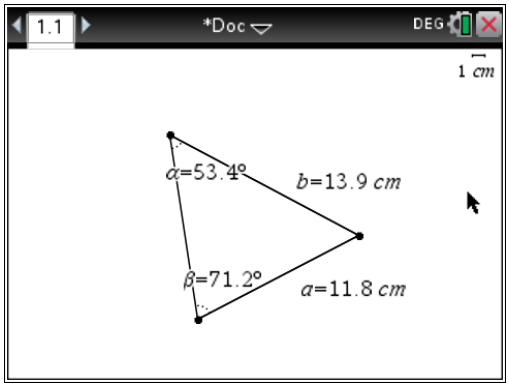
Construct a triangle



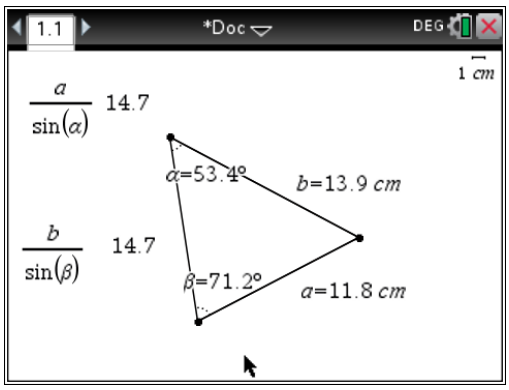
Measure angles



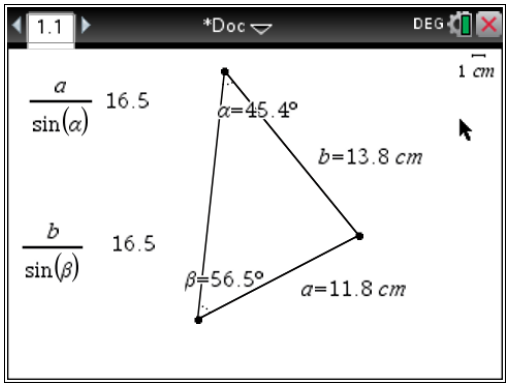
Measure sides



Use Text to type as seen below. Then Use calculate to get the ratios.



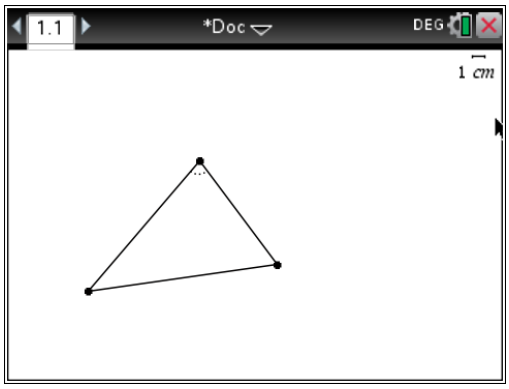
Vary the dimensions of a triangle and observe the ratios.



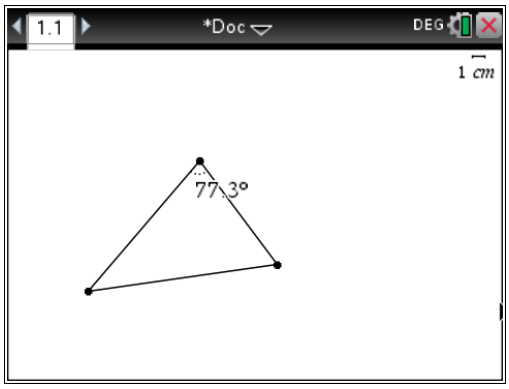
What can you deduce?

Cosine rule in Geometry Page

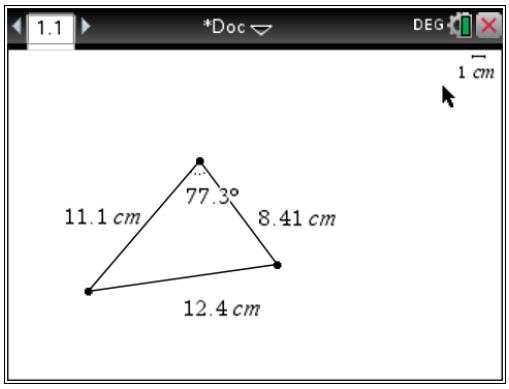
Draw a triangle.



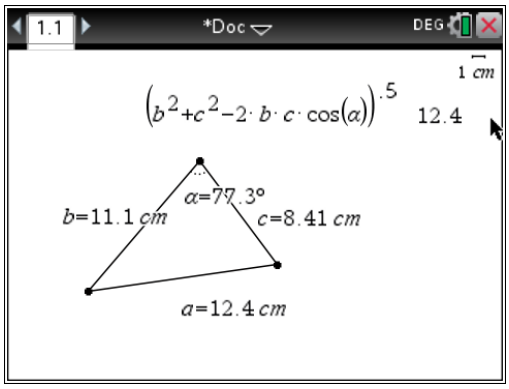
Measure one angle.



Measure three sides.



Use Text to type the cosine rule. Use Calculate to find side *a*.



Vary the dimensions of the triangle and observe the numbers.