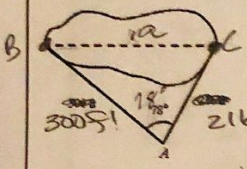
LOC-LOS Applications

Laws of Sines & Cosines Applications

Example 1

A trigonometry class wants to determine the length of a pond near the school. From a point, *A*, they measure the distance to each end of the pond and the angle between these two sides. What is the approximate length of the pond?



SAS → LOC

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

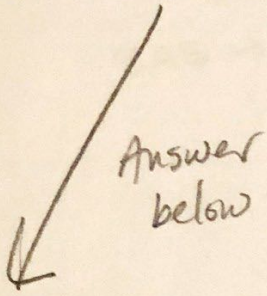
$a^2 = 300^2 + 216^2 - 2(300)(216)\cos 78$

$x^2 = 109710.6449$

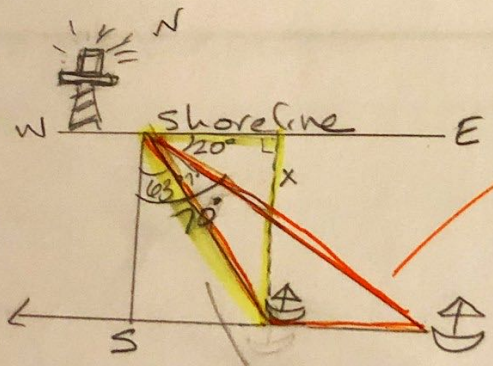
$x = 331.2$ ft.

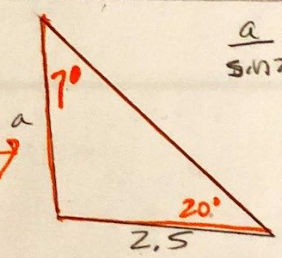
Example 2

A boat is sailing due west parallel to the shoreline at a speed of 10 miles per hour. At a given time the bearing from the lighthouse is S 70° E, and 15 minutes later the bearing is S 63° E. Find the distance from the boat to the shoreline if the lighthouse is at the shoreline.



Ex. 2



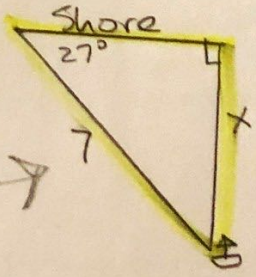


$\frac{a}{\sin 20} = \frac{2.5}{\sin 7}$

$a = 7$ miles from boat to lighthouse

$15 \text{ min} = \frac{1}{4} \text{ hr}$

$\frac{1}{4}(10 \text{ mph}) = 2.5 \text{ miles}$



$\sin 27 = \frac{x}{7}$

$x = 3.2$ miles