4.2 Sine Law with Obtuse Triangles

**Review**: Draw the triangle that corresponds to the following equation: , then solve.

Bearings in Foundations 11:

Ex 1. The captain of a small boat is delivering supplies to two lighthouses. His compass indicates that the lighthouse A is located at N30ᵒW and is 9km away. Lighthouse B is located at N50ᵒE. The two lighthouses are 12km apart. Draw a diagram and determine the angle at lighthouse B.

Using your calculator to explore the sine ratio:

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| **Reference angle**  |  | **Supplement of  =** |  |
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What do you notice about the value for sine for angles and their supplements?

**Be careful when using the sine law to determine the measure of an ANGLE. The inverse sine of a ratio ALWAYS gives an acute angle, but the supplementary angle has the exact same ratio. You must decide whether the acute angle , or the obtuse angle, , is the correct angle for your triangle.**

Ex 2. In an obtuse triangle,  measures  and its opposite side b has a length of 40 cm. Side ***A*** is the longest side of the triangle, with a length of 65 cm. Determine the measure of  to the nearest tenth of a degree.

Ex 3. Colleen and Juan observed a tethered balloon advertising the opening of a new fitness center. They were standing 250 metres apart, joined by a line that passed directly below the balloon and were on the same side of the balloon. Juan observed the balloon at an angle of elevation of  while Colleen observed the balloon at an angle of elevation of . Determine the height of the balloon to the nearest metre.