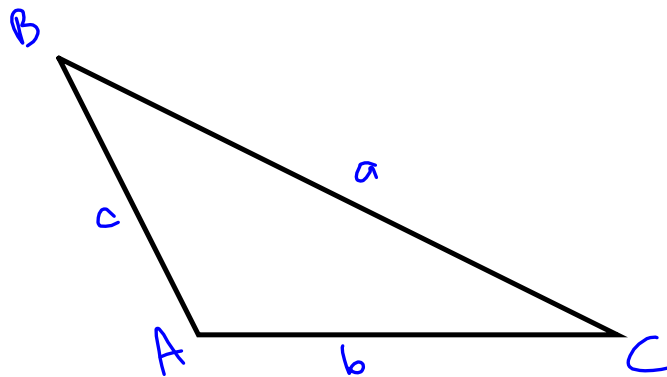


5.6 The Sine Law

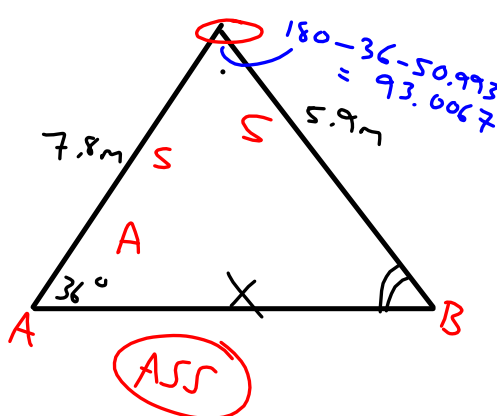
May 5

The Sine Law		
$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$	OR	
$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$		



Albert and Belle are part of a scientific team studying thunderclouds. The team is about to launch a weather balloon into an active part of a cloud. Albert's rope is 7.8 m long and makes an angle of 36° with the ground. Belle's rope is 5.9 m long.

? How far, to the nearest tenth of a metre, is Albert from Belle?



$$\frac{\sin B}{7.8} = \frac{\sin 36}{5.9}$$

$$B = \sin^{-1}\left(\frac{7.8 \sin 36}{5.9}\right) = 50.993$$

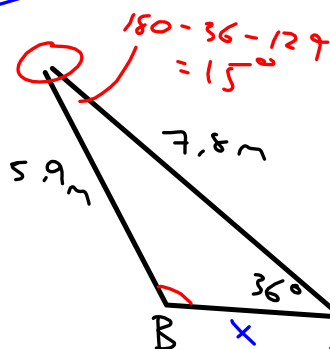
$$\frac{X}{\sin(93.0067)} = \frac{5.9}{\sin 36}$$

$$X = \frac{5.9 \sin(93.0067)}{\sin 36} = 10.0$$

OBTUSE

\therefore THEY ARE 10.0 m APART.

OR



$$\frac{\sin B}{7.8} = \frac{\sin 36}{5.9} \rightarrow B = 51^\circ, 129^\circ$$

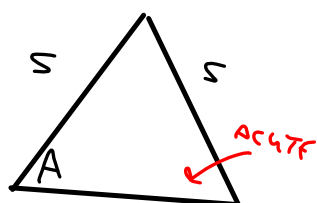
$$\frac{X}{\sin 15} = \frac{5.9}{\sin 36} \rightarrow X = 2.6$$

\therefore THEY ARE EITHER 10m APART OR 2.6m APART.

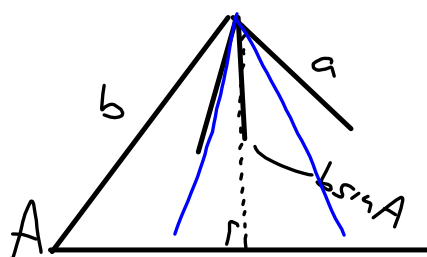
AMBIGUOUS

the ambiguous case of the sine law

- The ambiguous case arises in a SSA (side, side, angle) triangle. In this situation, depending on the size of the given angle and the lengths of the given sides, the sine law calculation may lead to 0, 1, or 2 solutions.



CASES



- 1) IF $a > b \rightarrow 1 \Delta$
- 2) IF $a = b \sin A \rightarrow \text{RIGHT } \Delta$
- 3) $b \sin A < a < b \rightarrow 2 \Delta$'s
- 4) $a < b \sin A \rightarrow 0 \Delta$

p. 318#2,3,5,8,9,10,14

Karl's campsite is 15.6 m from a lake and 36.0 m from a scenic lookout as shown. From the lake, the angle formed between the campsite and the lookout is 140° . Karl starts hiking from his campsite to go to the lookout. What is the **bearing** of the lookout from Karl's position ($\angle NAC$)?