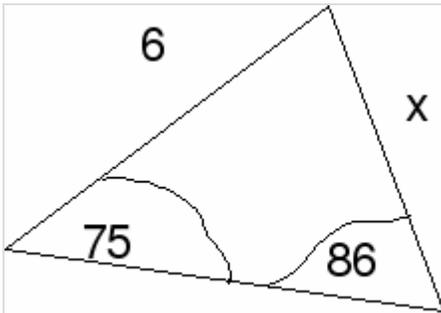
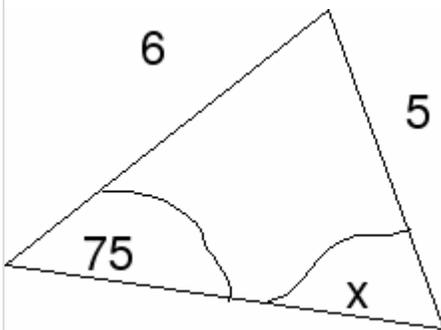


## The Sine Rule

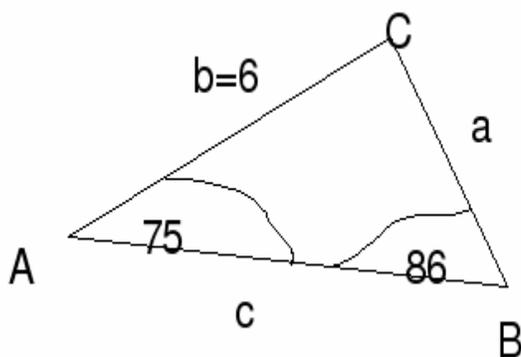
We can use the sine rule to



1. Find a side when it is opposite a known angle and we also have another side opposite another angle, both of which we know:



2. Find an angle when it is opposite a known side and we also have another side opposite another angle, both of which we know



To find the side as in 1 we start by labelling the sides a,b,c and the angles A,B,C with sides opposite their respective angles as shown.

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

$$\frac{a}{\sin 75} = \frac{6}{\sin 86}$$

$$a = \frac{6}{\sin 86} \sin 75 = 5.81$$

To find an angle we start by labelling the sides a,b,c and the angles A,B,C with sides opposite their respective angles as shown.

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

$$\sin B = \frac{b \sin A}{a} = \frac{4 \sin 75}{6} = 0.644$$

$$B = \sin^{-1} 0.644 = 40.09 \text{ degrees}$$

