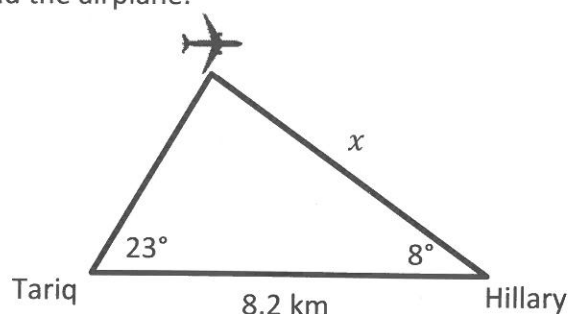


### Example 3

Tariq sees an airplane flying away from him at an angle of elevation of  $23^\circ$ . Hillary, who is 8.2 km away from Tariq, sees the same airplane flying toward her at an angle of elevation of  $8^\circ$ . Calculate the distance between Hillary and the airplane.



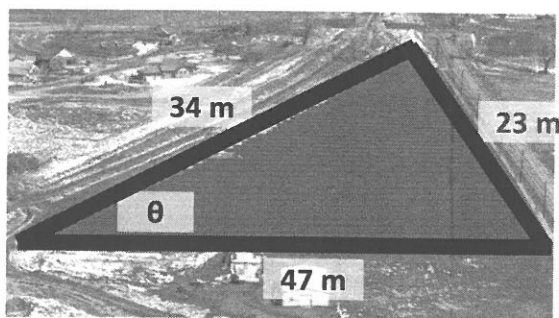
This is a sine law problem, since after finding the 3<sup>rd</sup> angle ( $180^\circ - 23^\circ - 8^\circ = 149^\circ$ ) we have a set of 'partners' ( $149^\circ$  and 8.2 km). Set it up in the sine law formula and solve:

$$\frac{8.2}{\sin 149^\circ} = \frac{x}{\sin 23^\circ}$$
$$x = 8.2 \times \sin 23^\circ \div \sin 149^\circ$$

$$x = 6.22 \text{ km}$$

### Example 4

A triangular solar farm in Colorado has sides measuring 23 m, 34 m and 47 m. Determine the size of the *smallest* angle contained in the triangle. Notice that the smallest angle is opposite the smallest side!



Cosine law (no partners):

$$\cos \theta = \frac{34^2 + 47^2 - 23^2}{2(34)(47)}$$

$$\cos \theta = \frac{2836}{3196}$$

$$\theta = 27.46^\circ$$