

3.

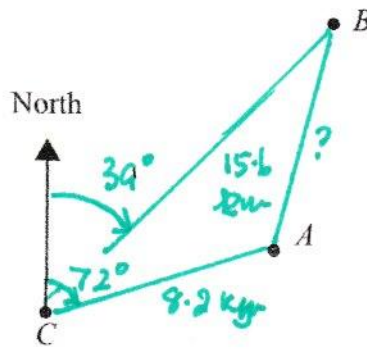


Figure 1

Figure 1 is a sketch showing the position of three phone masts,  $A$ ,  $B$  and  $C$ .

The masts are identical and their bases are assumed to lie in the same horizontal plane.

From mast  $C$

- mast  $A$  is 8.2 km away on a bearing of  $072^\circ$
- mast  $B$  is 15.6 km away on a bearing of  $039^\circ$

(a) Find the distance between masts  $A$  and  $B$ , giving your answer in km to one decimal place.

(3)

An engineer needs to travel from mast  $A$  to mast  $B$ .

(b) Give a reason why the answer to part (a) is unlikely to be an accurate value for the distance the engineer travels.

(1)

*Data transferred to the diagram.*

(a) In  $\triangle ABC$  we have two sides and the included angle  
i.e.  $CA = 8.2$  km,  $CB = 15.6$  km and  $\hat{BCA} = 72 - 39 = 33^\circ$

So using cosine rule

$$\begin{aligned} AB^2 &= AC^2 + CB^2 - 2AC \cdot CB \cos \hat{BCA} \\ &= 8.2^2 + 15.6^2 - 2 \times 8.2 \times 15.6 \times \cos 33^\circ \\ &= \underline{9.8 \text{ km}} \text{ using calculator.} \end{aligned}$$

(b) The road is unlikely to be straight!

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

