Bearings

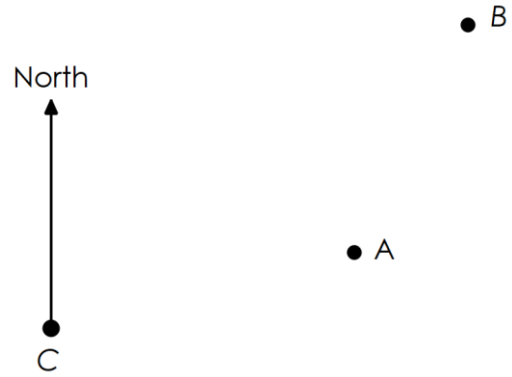


Figure 2

Figure 2 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 8.7 km away on a bearing of 082°
- mast B is 14.9 km away on a bearing of 038°

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

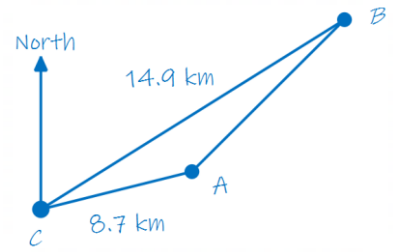
(3 marks)

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 mark)

a. The three masts form a triangle



Angle ACB $= 82° - 38°$
$= 44°$ 1 mark

Use the Cosine Rule to find the length of AB

$a^2 = b^2 + c^2 - 2bc\cos A$

$AB^2 = 14.9^2 + 8.7^2 - 2 \times 14.9 \times 8.7 \times \cos 44°$ 1 mark

$AB^2 = 222.01 + 75.69 - 259.26\cos 44°$

$AB^2 = 297.7 - 259.26\cos 44°$

$AB^2 = 111.203...$

$AB = \sqrt{111.203...}$

$AB = 10.5$ km 1 mark

b. A reason such as 'the road is not likely to be straight' is fine for this part. The implication is that the distance will, therefore, be greater, but there is no need to state this.

1 mark