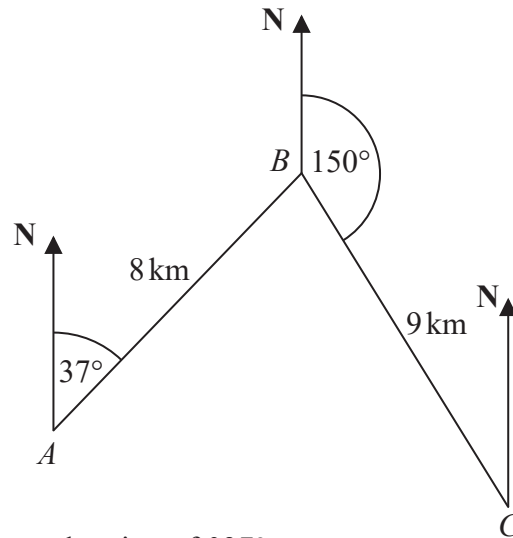


1. The diagram shows the positions of three towns, Acton (A), Barston (B) and Chorlton (C).



Barston is 8 km from Acton on a bearing of 037°
 Chorlton is 9 km from Barston on a bearing of 150°

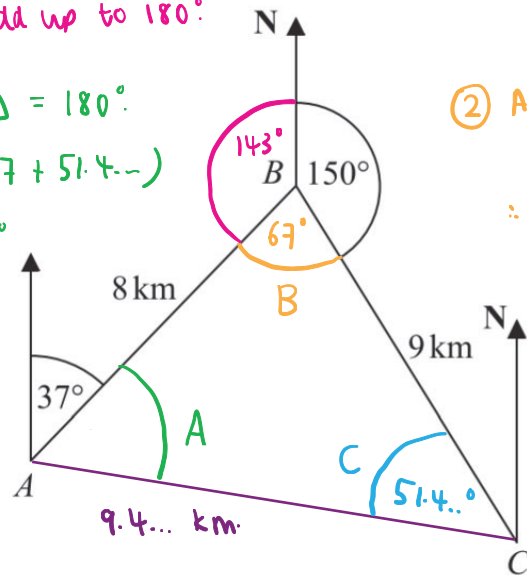
Find the bearing of Chorlton from Acton.
 Give your answer correct to 1 decimal place.
 You must show all your working.

$$\text{Bearing} = 37 + A^\circ$$

① co-interior angles
add up to 180°

⑤ Angles in $\Delta = 180^\circ$
 $A = 180 - (67 + 51.4\dots)$
 $= 61.5786\dots^\circ$

①



② Angles around a point
add up to 360°
 $\therefore B = 360 - (150 + 143) = 67^\circ$

④ Sine rule: $\frac{\sin C}{8} = \frac{\sin 67}{9.41\dots}$

$$(9.41\dots) \sin C = 8 (\sin 67)$$

① $\sin C = 0.78175\dots$
 $\therefore C = 51.42131479\dots^\circ$

③ Find length AC using cosine rule:

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

$$AC^2 = 8^2 + 9^2 - (2 \times 8 \times 9 \times (\cos 67))$$

$$AC^2 = 88.7347175\dots$$

①

$$\therefore AC = 9.419910695\dots \text{ km}$$

⑥ Bearing = $37 + A$

$$= 37 + 61.5786\dots$$

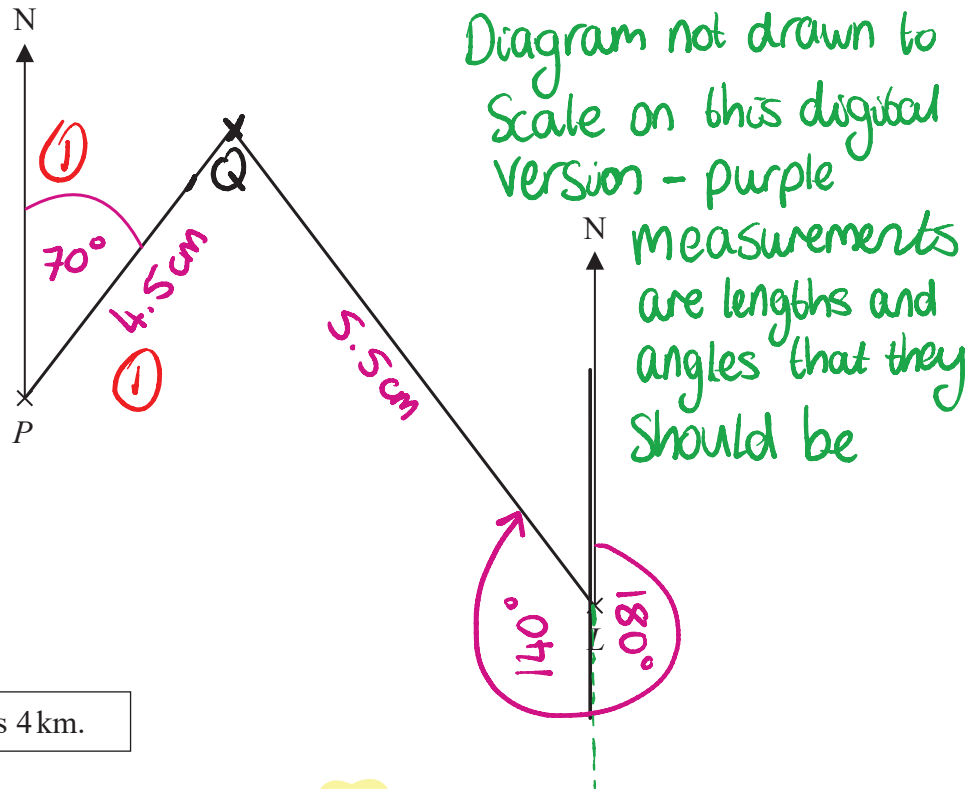
$$= \underline{098.6^\circ} \text{ (1dp)}$$

①

098.6

(Total for Question is 5 marks)

2. The accurate scale drawing shows the positions of port P and a lighthouse L .



Scale: 1 cm represents 4 km.

Aleena sails her boat from port P on a bearing of 070°

She sails for $1\frac{1}{2}$ hours at an average speed of 12 km/h to a port Q .

Find

- the distance, in km, of port Q from lighthouse L ,
- the bearing of port Q from lighthouse L .

i) distance = speed \times time

$$\text{distance} = 12 \times 1.5 = 18 \text{ km}$$

$$\begin{array}{l} 1 \text{ cm} : 4 \text{ km} \\ \times 4.5 \quad \times 4.5 \\ 4.5 \text{ cm} : 18 \text{ km} \end{array}$$

$$\begin{array}{l} 1 \text{ cm} : 4 \text{ km} \\ \times 5.5 \quad \times 5.5 \\ 5.5 \text{ cm} : 22 \text{ km} \end{array}$$

ii) bearing of port Q from lighthouse L

$$180^\circ + 140^\circ = 320^\circ$$

distance $QL = 22 \text{ km}$

bearing of Q from $L = 320^\circ$