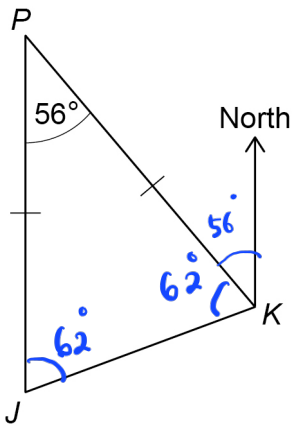
1 *J* and *K* are ships.

P is a port.

J is due South of *P*.

Angle *JPK* = 56°

JP = *KP*



Not drawn accurately

Work out the bearing of *J* from *K*.

[3 marks]

$180° - 56° = 124°$

$124 \div 2 = 62°$ (1)

$360° - 62° - 56° = 242°$ (1)

(1)

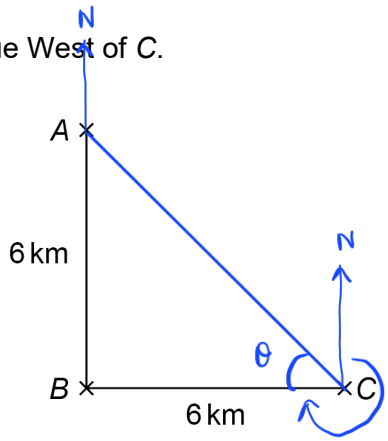
Answer 242 °

2 (a) *B* is

6 km due South of *A*

and

6 km due West of *C*.



Not drawn accurately

Work out the bearing of *A* from *C*.

[2 marks]

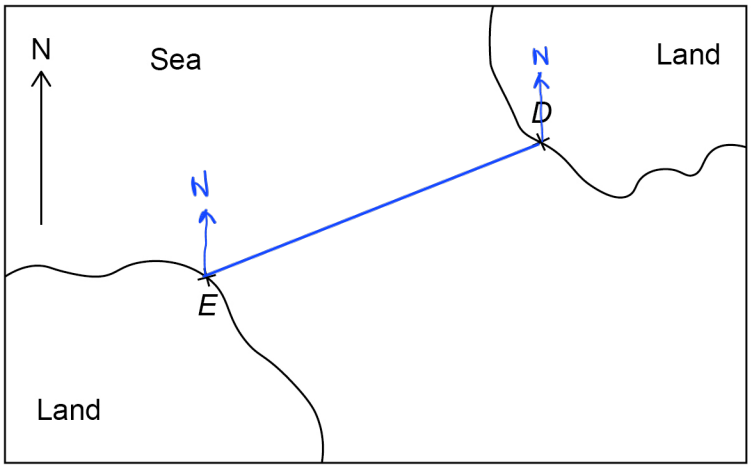
$\tan\theta = \frac{6}{6} = 1$

$\theta = \tan^{-1} 1 = 45^\circ$ (1)

Bearing $= 180^\circ + 90^\circ + 45^\circ = 315^\circ$ (1)

Answer 315 °

2 (b) Here is a scale drawing.



A ship is going to sail from *D* to *E*.

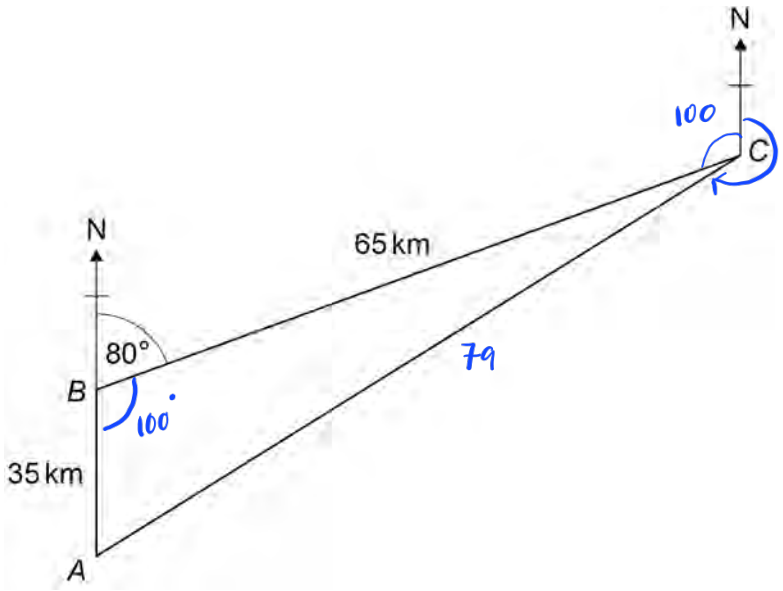
Mia works out that the ship needs to sail on a bearing of 068°

Why must Mia be wrong?

[1 mark]

068° is bearing of D from E. (1)

3



Not drawn accurately

A boat sails 35 km North from *A* to *B*.

From *B* the boat sails to *C* and then back to *A*.

3 (a) Show that the distance the boat sails from *C* to *A* is 79 km to the nearest km

You **must** show your working.

[2 marks]

$AC^2 = 65^2 + 35^2 - 2(65)(35)\cos 100^\circ$ (1)

$= 4225 + 1225 - 4550\cos 100^\circ$

$= 5450 + 790$

$= 6240$

$AC = \sqrt{6240}$

$= 78.9\ldots$ (1)

≈ 79 (nearest km)

3 (b) Work out the bearing of *A* from *C*.

[4 marks]

$\frac{\sin ACB}{35} = \frac{\sin 100}{79}$ (1)

$\sin ACB = \frac{35 \sin 100}{79}$

$\sin ACB = 0.436\ldots$ (1)

$ACB = \sin^{-1} 0.436\ldots$

$= 25.8\ldots$ (1)

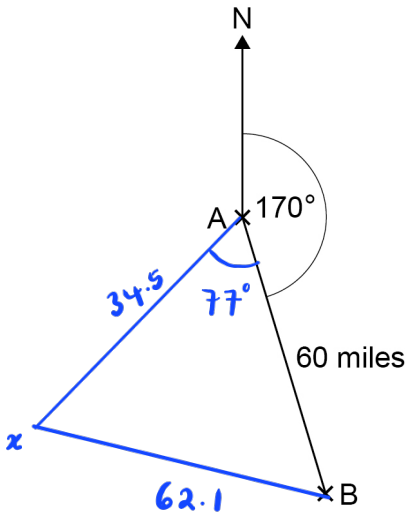
Bearing of A from C : $360^\circ - 100^\circ - 25.8^\circ$

$= 234.2^\circ$ (1)

Answer 234.2 °

4 B is 60 miles from A on a bearing of 170°

Not drawn accurately



A ship sails from A on a bearing of 247°

It travels at a constant speed of 23 mph for $1\frac{1}{2}$ hours.

Is the ship now closer to B than it was when it left A?

You **must** show your working.

[5 marks]

$247° - 170° = 77°$ (1)

distance $= 23 \times 1.5 = 34.5$ (1)

$xB^2 = 34.5^2 + 60^2 - 2(34.5)(60)\cos 77°$ (1)

$= 3858$

$xB = \sqrt{3858}$ (1)

$= 62.1$

(1)

No. The ship is further away.