



- 1 Write down the three-figure bearing of the direction

- a. due east
b. due south-west

(2 marks)

Bearings are measured clockwise from north and written with three figures

Due east is a quarter turn clockwise from north, so the bearing is 090°

Due south-west is halfway between south (180°) and west (270°), so the bearing is 225°

- 2 Town B is on a bearing of 065° from town A.

Work out the bearing of A from B.

(2 marks)

Back bearing: add or subtract 180°

$$65 + 180 = 245$$

245°

- 3 The bearing of a ship S from a lighthouse L is 038° .

Work out the bearing of L from S.

(2 marks)

The back bearing differs from the original bearing by 180°
 038° is less than 180° , so add 180°

$$38 + 180 = 218, \text{ so the bearing of L from S is } 218^\circ$$

Looking back along the same route reverses your direction by half a turn, 180° . The north lines at the two places are parallel

218°

- 4 The bearing of a harbour H from a lighthouse L is 312° .

Work out the bearing of L from H.

(2 marks)

312° is bigger than 180° , so subtract 180°

$$312 - 180 = 132$$

132°

- 5 The bearing of a port Q from a port P is 295° .

Work out the bearing of P from Q.

(2 marks)

The back bearing differs from the original bearing by 180°
 295° is more than 180° , so subtract 180°

$295 - 180 = 115$, so the bearing of P from Q is 115°

115°

- 6 A ship sails from port P due east to port Q.

It then sails from Q to port R. The bearing of R from Q is 200° .

Work out the bearing of Q from R. Give your answer as a three-figure bearing.

(3 marks)

Back bearing of 200° : subtract 180°

$$200 - 180 = 20$$

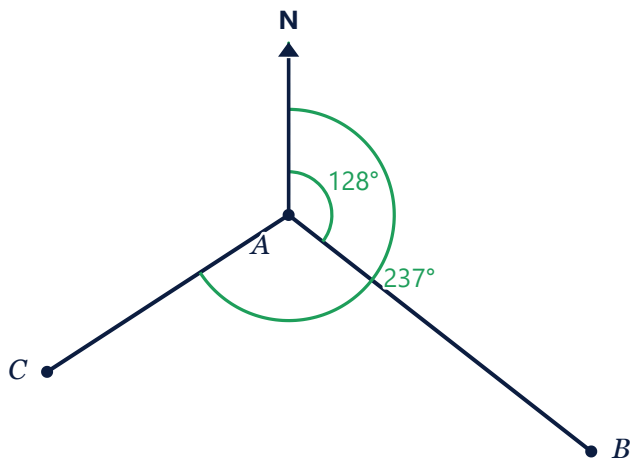
Bearings need three figures

020°

7

The diagram shows three points A , B and C .

- Use a protractor to measure the bearing of B from A .
- Use a protractor to measure the bearing of C from A .



(3 marks)

a)

Centre the protractor on A , zero on the north line

Measure clockwise from north to AB

128°

b)

AC is on the west side: angle anticlockwise from north is 123°

$$360 - 123 = 237$$

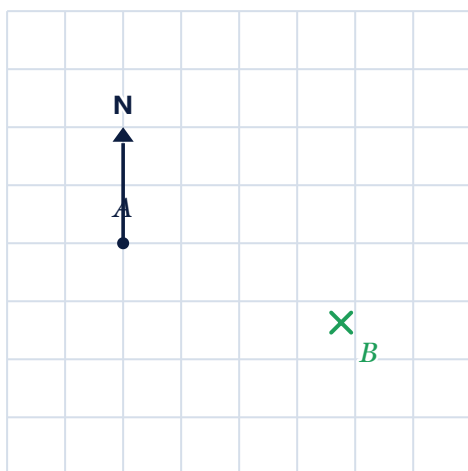
237°

8

The scale of a map is 1 cm to 2 km.

Village B is 8 km from village A on a bearing of 110° .

Mark the position of B on the map with a cross.



(3 marks)

Convert the real distance to a map distance

$$8 \text{ km} \div 2 \text{ km per cm} = 4 \text{ cm}$$

Place a protractor at A with 0° pointing north and measure 110° clockwise

Draw a faint line from A along this direction and mark B exactly 4 cm from A

9

Village B is on a bearing of 084° from village A.

Village C is on a bearing of 167° from village B.

- Write down the bearing of A from B.
- Work out the size of angle ABC.

(3 marks)

a)

Back bearing of 084° : add 180°

$$84 + 180 = 264$$

264°

b)

Both bearings are measured from the north line at B

$$264 - 167 = 97$$

97°

- 10 A plane flies in a straight line from airport A to airport B on a bearing of 068° . It then flies in a straight line from B to airport C on a bearing of 155° . Work out the size of angle ABC.

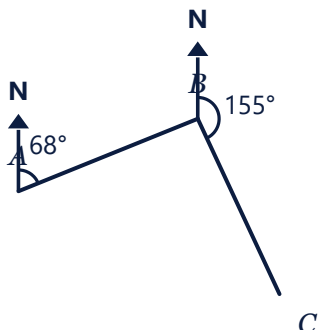


Diagram NOT accurately drawn

(3 marks)

The bearing of A from B is the back bearing of 068° , which is $068 + 180 = 248^\circ$

At B, the direction to C is 155° and the direction to A is 248°

$$\text{Angle ABC} = 248 - 155 = 93^\circ$$

93

- 11 A boat sails from a harbour H on a bearing of 050° to a buoy Q. It then sails due south from Q to a point R. R is due east of H.

- Write down the bearing of H from Q.
- Work out the size of angle HQR.

(3 marks)

a)

$$50 + 180 = 230$$

230

b)

Due south is 180°

$$230 - 180 = 50$$

50

12

B is on a bearing of 060° from A.

C is on a bearing of 140° from A.

$AB = AC$.

Work out the bearing of C from B.

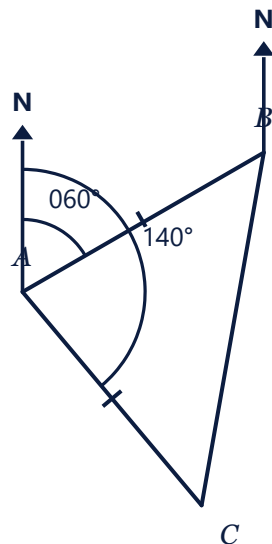


Diagram NOT accurately drawn

(3 marks)

$$\text{Angle } BAC = 140 - 60 = 80^\circ$$

Triangle ABC is isosceles with $AB = AC$, so angle $ABC = \text{angle } ACB = (180 - 80) \div 2 = 50^\circ$

The bearing of A from B is the back bearing of 060° , which is 240°

C lies 50° anticlockwise from the direction BA, so the bearing of C from B is $240 - 50 = 190^\circ$

190°

13

A walker leaves a car park C and walks 5 km due north to a lake L. She then walks 12 km due west to a viewpoint V.

- Work out the straight-line distance CV.
- Work out the bearing of C from V. Give your answer to the nearest degree.

(5 marks)

a)

$$CV^2 = 5^2 + 12^2$$

$$CV^2 = 169$$

$$CV = \sqrt{169} = 13 \text{ km}$$

13 km

b)

Angle at V: opposite 5, adjacent 12

$$\tan x = \frac{5}{12}$$

$$x = 22.6^\circ$$

L is due east of V (090°) and C is south of that

$$90 + 22.6 = 112.6$$

113°

14

A map has a scale of 1 : 50 000.

On the map, the distance from a church to a school is 6 cm.

The bearing of the school from the church is 132° .

- Work out the real distance from the church to the school. Give your answer in kilometres.
- Work out the bearing of the church from the school.

(4 marks)

$$\text{a) Real distance} = 6 \text{ cm} \times 50\,000 = 300\,000 \text{ cm}$$

$$300\,000 \text{ cm} = 3000 \text{ m} = 3 \text{ km}$$

b) The back bearing differs by 180°

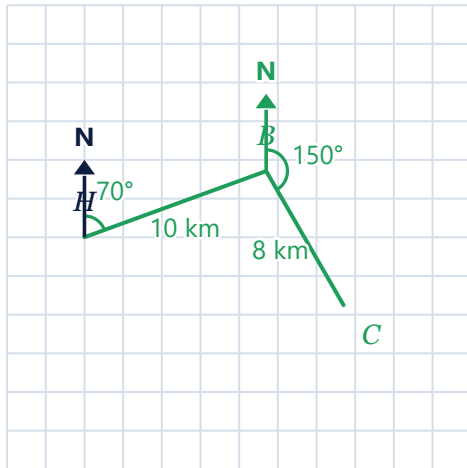
$$132 + 180 = 312^\circ$$

15

A boat leaves a harbour H and sails 10 km on a bearing of 070° to a buoy B.

It then sails 8 km on a bearing of 150° to a point C.

- Using a scale of 1 cm to 2 km, make an accurate scale drawing of the journey.
- Use your drawing to find the distance and the bearing of C from H.



(5 marks)

Convert to map lengths

$$10 \text{ km} = 5 \text{ cm and } 8 \text{ km} = 4 \text{ cm}$$

From H, draw a north line, measure 070° clockwise and draw $HB = 5 \text{ cm}$

From B, draw a north line, measure 150° clockwise and draw $BC = 4 \text{ cm}$

Measure HC

it is about 6.9 cm, which is $6.9 \times 2 = 13.8$ to 13.9 km

Measure the angle at H from north to HC: about 105° , so the bearing of C from H is about 105°

16

B is 15 km due east of A.

C is 9 km due south of B.

- Work out the distance AC. Give your answer correct to 1 decimal place.
- Work out the bearing of C from A. Give your answer correct to the nearest degree.

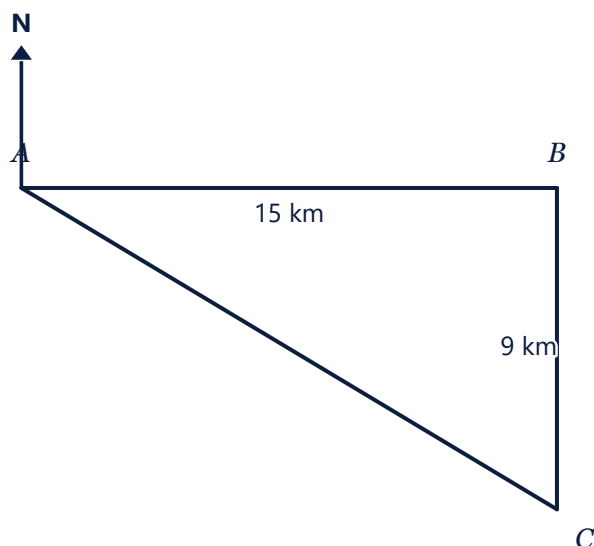


Diagram NOT accurately drawn

(5 marks)

Triangle ABC has a right angle at B, with $AB = 15$ km and $BC = 9$ km

a) $AC^2 = 15^2 + 9^2 = 225 + 81 = 306$, so $AC = \sqrt{306} = 17.492... = 17.5$ km (1 dp)

b) The angle at A below due east satisfies $\tan x = 9 \div 15 = 0.6$, so $x = 30.96...^\circ$

The bearing of C from A = $090 + 30.96... = 120.96...^\circ = 121^\circ$ to the nearest degree