



Bearings

- Measuring and calculating three-figure bearings
- Drawing diagrams involving three-figure bearings

Keywords

You should know

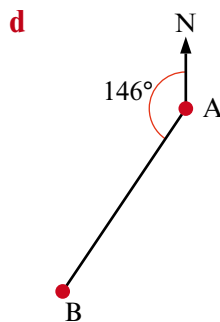
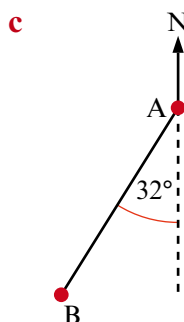
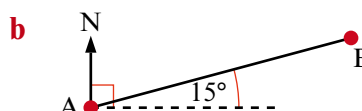
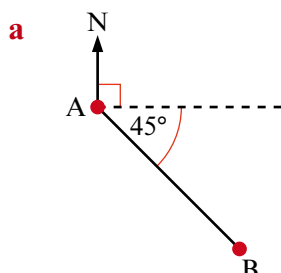
explanation 1a

explanation 1b

explanation 1c

explanation 1d

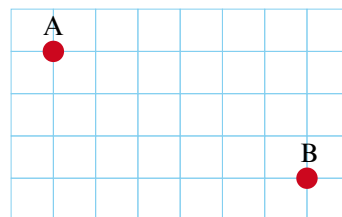
1 Calculate the three-figure bearing of B from A in each of these diagrams.



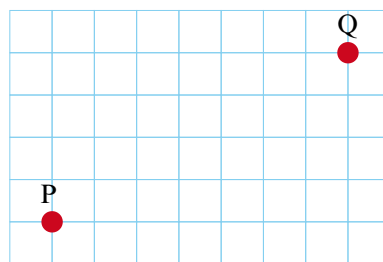
2 Without measuring, calculate the three-figure bearings of A from B in each of the diagrams in question 1 above.

From now on, you will need a protractor. Take North to be vertically up the page.

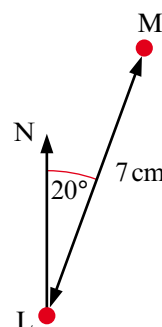
- 3 a** Copy the diagram on squared paper.
- b** Showing your construction clearly, measure the bearing of B from A.
- c** Calculate the bearing of A from B.
- d** What is the difference between your answers for **b** and **c**?



- 4 a** Copy the diagram on squared paper.
- b** Showing your construction clearly, measure the bearing of Q from P.
- c** Calculate the bearing of P from Q. Show your working.
- d** What is the difference between your answers for **b** and **c**?



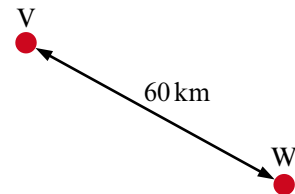
- 5 a** Plot two points, L and M, so that they are 7 cm apart and the bearing of M from L is 020° .
- b** Calculate the bearing of L from M. Show your working.
- c** Check your answer to part **b** by measuring.



- 6 a** Plot two points, J and K, such that they are 3 cm apart and the bearing of K from J is 322° .
- b** Calculate the bearing of J from K. Show your working.
- c** Check your answer to part **b** by measuring.
- 7** Two points, K and L, are 7.5 km apart. L is due north of K. A third point, M, is on a bearing of 045° from L and on a bearing of 022° from K.
- a** Plot the points K, L and M using a scale of 1 : 125 000. Remember to make a sketch first.
- b i** Measure the distance of M from both K and L on your diagram.
- ii** Calculate the actual distance of M from both K and L.
- c** Without measuring, calculate the angle LMK. Show your working.
- d** Calculate the bearing of L from M.

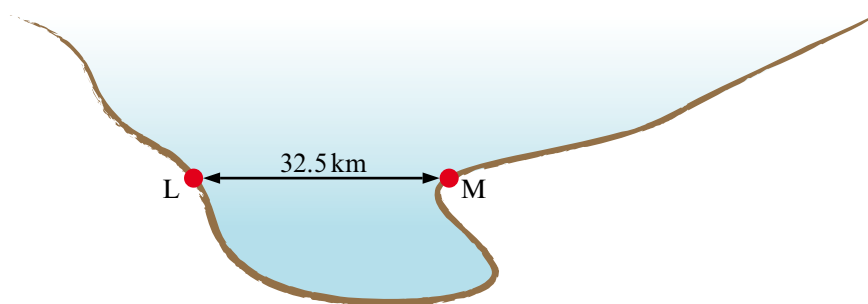
- 8** Town X is 8 km due west of town Y.
 A third town Z is on a bearing of 155° from X and on a bearing of 225° from Y.
- Make a scale drawing using a scale of 1 : 100 000. Locate the position of Z.
 - To the nearest millimetre, measure the distance of Z from both X and Y.
 - What is the real distance of Z from X and Y in kilometres?
 - Without measuring, calculate the angle YXZ.
 - Without measuring, calculate the angle XZY.

- 9** Points V and W are 60 km apart.
 The bearing of W from V is 120° .



- Make a scale drawing showing the position of V and W. Use a scale of 1 : 750 000.
 - Construct the locus of points that are equidistant from V and W.
 - A point U is 45 km from both V and W.
 Mark on your diagram the possible positions for point U.
 - Measure the bearing of V from each of the possible positions for U.
 - Measure the bearing of W from each of the possible positions for U.
- 10** Town B is 6.50 km due east of Town A.
 Town C is 4.55 km from A and on a bearing of 125° .
- Using a scale of 1 : 130 000, draw a scale diagram showing the positions of the three towns relative to each other.
 - Measure the bearing of town B from town C.
 - Measure the distance, in centimetres, between B and C on your diagram.
 - Calculate the actual distance, in kilometres, between towns B and C.
- 11** Ahmed, Brian and Carlos are standing in a large field. Carlos is 210 m due north of Brian. Ahmed is 135 m and on a bearing of 300° from Brian.
- Using a scale of 1 : 3000, draw a scale diagram showing the position of the three boys relative to each other.
 - What is the bearing of Carlos from Ahmed?
 - What is the actual distance between Ahmed and Carlos?

- 12** Lighthouse L is 32.5 km due west of lighthouse M as shown in the diagram.



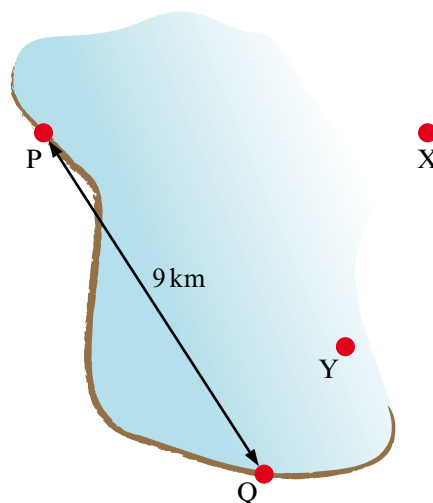
A distress signal is received from a boat, B, out at sea. From L the distress signal is on a bearing of 010° . From M the distress signal is on a bearing 315° .

- Using a scale of 1 : 500 000, draw a scale diagram showing the position of L and M relative to each other.
 - Using a protractor, find the position of the boat B.
 - On your diagram measure the distance of the boat from each of the lighthouses, in centimetres.
 - Calculate the actual distance, in kilometres, of the boat from each of the lighthouses.
- 13** Two observers, P and Q, are standing on a shoreline 9 km apart. The bearing of P from Q is 320° .

Boat X is 8.25 km due east of P.

Boat Y is 4.80 km on a bearing of 025° from Q.

- Using a scale of 1 : 150 000, draw a scale diagram of the positions of P, Q, X and Y relative to each other.
- Measure the distance XY on your diagram.
- Calculate the actual distance between boats X and Y.
- What is the bearing of X from Y?
- What is the bearing and actual distance of X from Q?
- What is the bearing and actual distance of Y from P?



14 Mayday! Mayday!

The coastguard station gets an SOS message from a sinking trawler.

The message they receive is broken by static and all they hear is

‘... buoy A is on a bearing of 300° from us and ... B is on ... of 027° from us.
... sinking fast ... SOS SOS ...’

Imagine you are the coastguard who receives the message.

Your map shows buoys A and B are 5 km apart and the bearing of B from A is 100° .

Discuss with a partner how you would tackle this before drawing anything accurately.

When you have decided how to tackle it, find where the trawler could be and rescue the crew!

**15** Phil, Liz, Charlie, Andi and Ed go on their Duke of Edinburgh weekend expedition, but get lost after leaving their second base (S).

They know they walked at a steady 4 kilometres per hour for 2 hours.

They see the third base (T) on a bearing of 225° .

They know that T was 14 km on a bearing of 200° from S when they set out.

Work with a partner. Draw a diagram to show where they could be and work out the least and most time it will take them to get to T if they walk at the same speed directly towards T.

