



4.16F Bearings: Foundation Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 50 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Write down the bearing of B from A.
A and B are two points. The direction from A to B is due east.

(Total for Question 1 is 1 mark)

- 2** Write down the bearing of C from A.
The direction from A to C is due south.

(Total for Question 2 is 1 mark)

- 3** A boat sails from harbour H to point P on a bearing of 045 degrees.
Work out the bearing of H from P.

(Total for Question 3 is 2 marks)

- 4** On a map, a path from X to Y has a bearing of 300 degrees.
Work out the bearing of X from Y.

(Total for Question 4 is 2 marks)

- 5** A walker stands at point W. The bearing of tree A from W is 072 degrees. The bearing of tree B from W is 162 degrees.
Work out the angle AWB between the two trees, as seen from W.

(Total for Question 5 is 3 marks)

- 6** Town P is due west of town Q. A plane leaves P and flies to R on a bearing of 030 degrees. Work out (i) the bearing of Q from P, and (ii) the bearing of P from R. Show your working for both.

(Total for Question 6 is 4 marks)

- 7** On a city map, north is 000 degrees. From station T, the bearing to bus stop U is 255 degrees. From station T, the bearing to bus stop V is 345 degrees.
Work out (i) the angle UTV between the two bus stops, as seen from T, and (ii) the bearing of T from V.

(Total for Question 7 is 4 marks)

- 8** A lifeboat leaves harbour H and travels on a bearing of 015 degrees for 6 km to reach point L. At L it turns clockwise through a right angle (so its bearing increases by 90 degrees) and travels for 4 km to reach point M. Work out the bearing of M from H. Give your answer to the nearest degree. Show your working clearly.

(Total for Question 8 is 5 marks)

- 9** A surveyor stands at point S. From S the bearing to monument A is 052 degrees and the bearing to monument B is 140 degrees. The surveyor is standing exactly the same distance from each monument ($SA = SB$). Work out the bearing of B from A. Show your full reasoning and give the answer to the nearest degree.

(Total for Question 9 is 8 marks)

- 10** Two yachts leave harbour Y at the same time. Yacht 1 sails to buoy B on a bearing of 075 degrees for 8 km. Yacht 2 sails to buoy C on a bearing of 165 degrees for 8 km (the same distance).

Work out the bearing of B from C. You must show all steps and explain how you used the information. Give your answer to the nearest degree.

(Total for Question 10 is 10 marks)

Mark scheme · 4.16F Bearings: Foundation Tier Practice

Question 1

- **B1** 090 degrees cao
- **Answer: 090 degrees**

Question 2

- **B1** 180 degrees cao
- **Answer: 180 degrees**

Question 3

- **M1** since the bearing H->P is less than 180, add 180: $045 + 180$
- **A1** 225 degrees cao
- **Answer: 225 degrees**

Question 4

- **M1** since the bearing X->Y is 180 or more, subtract 180: $300 - 180$
- **A1** 120 degrees cao
- **Answer: 120 degrees**

Question 5

- **M1** recognise angle AWB is the difference between the two bearings measured from the same point W
- **A1** $162 - 072 = 90$ degrees cao
- **B1** clear final statement that angle AWB = 90 degrees cao
- **Answer: 90 degrees**

Question 6

- **M1** recognise 'P is due west of Q' means Q is due east of P
- **A1** (i) 090 degrees cao
- **M1** back bearing of P from R: since the bearing P->R is less than 180, add 180: $030 + 180$
- **A1** (ii) 210 degrees cao
- **Answer: (i) 090 degrees (ii) 210 degrees**

Question 7

- **M1** recognise angle UTV is the difference between the two bearings measured from the same point T: $345 - 255$
- **A1** (i) 090 degrees cao
- **M1** back bearing of T from V: since the bearing T->V is 180 or more, subtract 180: $345 - 180$
- **A1** (ii) 165 degrees cao
- **Answer: (i) 090 degrees (ii) 165 degrees**

Question 8

- **M1** recognise triangle HLM is right-angled at L (the turn is 90 degrees) with HL = 6 km, LM = 4 km
- **M1** use trigonometry: $\tan(\text{angle LHM}) = \text{LM} / \text{HL} = 4/6$, so angle LHM = $\arctan(4/6)$
- **A1** angle LHM = 33.7 degrees (1 dp)
- **B1** bearing of M from H = bearing of L from H + angle LHM = $015 + 33.7 = 048.7$ cao
- **P1** communication: working shows the right-angled triangle, the trig ratio used, and the final bearing rounded to the nearest degree, 049 degrees
- **Answer: 049 degrees (to the nearest degree).**

Question 9

- **M1** state relative bearings from S: $S \rightarrow A = 052$, $S \rightarrow B = 140$; find angle $ASB = 140 - 52 = 88$ degrees (method)
- **M1** recognise triangle SAB is isosceles ($SA = SB$) so the base angles are equal: base angle $= (180 - 88)/2 = 46$ degrees
- **M1** find the back bearing of S from A: $052 + 180 = 232$ degrees
- **M1** combine: bearing $A \rightarrow B =$ bearing $A \rightarrow S$ - base angle $= 232 - 46$ (method)
- **A1** 186 degrees cao
- **B1** clear reasoning linking the isosceles triangle, the back bearing and the subtraction of the base angle
- **P1** presentation: working clearly shows angle ASB , the isosceles base angle, and the back bearing calculation
- **A1** final answer 186 degrees cao
- **Answer: 186 degrees**

Question 10

- **M1** find angle $BYC = 165 - 075 = 90$ degrees (method)
- **M1** recognise triangle YBC is isosceles ($YB = YC = 8$ km) so the base angles are equal: base angle $= (180 - 90)/2 = 45$ degrees
- **M1** find the back bearing of Y from C: $165 + 180 = 345$ degrees (method)
- **M1** combine: bearing of B from C $=$ bearing $C \rightarrow Y$ + base angle $= 345 + 45$ (method)
- **A1** $390 - 360 = 030$ degrees cao
- **B1** clear reasoning linking the isosceles triangle, the back bearing and the addition of the base angle
- **P1** presentation: steps shown clearly (angle BYC , base angle, back bearing, final bearing)
- **M1** alternative correct method: use a scale drawing or coordinate check to confirm B is on a bearing of 030 from C (method)
- **A1** final answer 030 degrees cao
- **C1** full correct solution with explanation and check (e.g. confirming triangle YBC is a right isosceles triangle, since angle $BYC = 90$)
- **Answer: 030 degrees**