4.16 Bearings: 1-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Write down the three-figure bearing for each compass direction.

(a) North-East **(1)**

.....

(b) South **(1)**

.....

(c) South-West **(1)**

.....

(d) West **(1)**

.....

(Total for Question 1 is 4 marks)

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2 Bearings are always measured clockwise from North and are always written using three figures.

(a) Write down the three-figure bearing for East. **(1)**

.....

(b) Write down the three-figure bearing for South. **(1)**

.....

(c) Write down the three-figure bearing for South-West. **(1)**

.....

(d) Write down the three-figure bearing for North-West. **(1)**

.....

(Total for Question 2 is 4 marks)

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3 Compass bearings are sometimes written using a quadrant form, such as N40E, which means starting from North and turning 40 degrees towards East. Write each of these as a three-figure bearing.

(a) N40E **(1)**

.....

(b) S25E **(1)**

.....

(c) S60W **(1)**

.....

(d) N70W **(1)**

.....

(Total for Question 3 is 4 marks)

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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)

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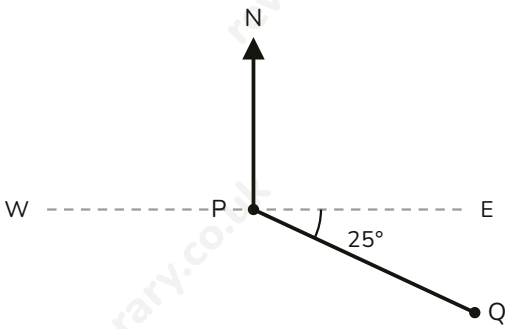
5 A walker stands at point W. The bearing of tree A from W is 072 degrees. The bearing of tree B from W is 162 degrees.
Work out the angle AWB between the two trees, as seen from W.

(Total for Question 5 is 3 marks)

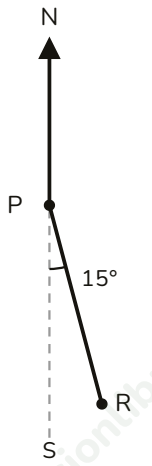
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6 In diagram (a), Q is 25 degrees south of East from P. In diagram (b), R is 15 degrees east of South from P.

Diagram NOT accurately drawn



(a)



(b)

(a) Using the fact that the angle between North and East is 90 degrees, work out the bearing of Q from P. **(2)**

.....

(b) Using the fact that the bearing of due South is 180 degrees, work out the bearing of R from P. **(2)**

.....

(Total for Question 6 is 4 marks)

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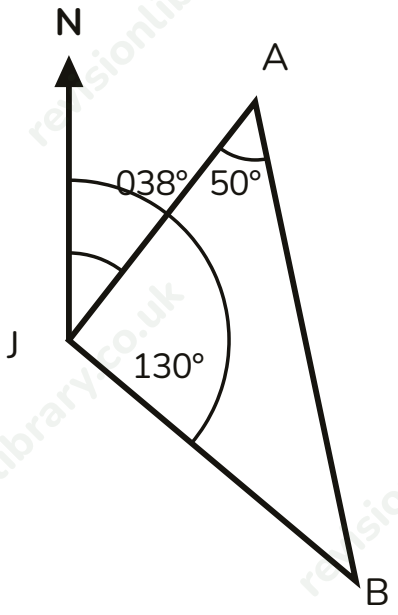
7 Priya rides her bicycle 6 km on a bearing of 040 from her home. A map of her journey is to be drawn using a scale of 1 cm to 2 km.

(Total for Question 7 is 2 marks)

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8 Connor lives in village A. J is a road junction. The bearing of village A from J is 038. The bearing of village B from J is 130. A, B and J form a triangle, and angle JAB = 50 degrees. Work out angle JBA.

Diagram NOT accurately drawn



(Total for Question 8 is 3 marks)

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9 The bearing of Sheffield from Nottingham is 038.
Work out the bearing of Nottingham from Sheffield.

Diagram NOT accurately drawn

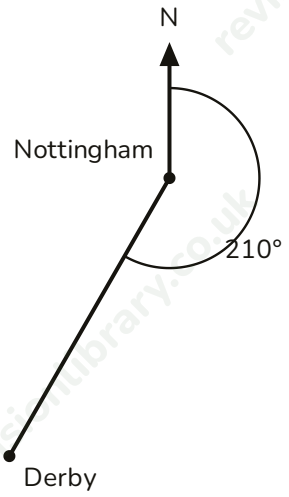


(Total for Question 9 is 2 marks)

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10 The bearing of Derby from Nottingham is 210.
Work out the bearing of Nottingham from Derby.

Diagram NOT accurately drawn

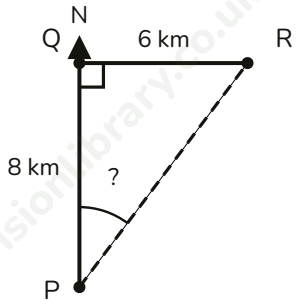


(Total for Question 10 is 2 marks)

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11 A ship sails 8 km due north from port P to point Q, then sails 6 km due east from Q to point R.

Diagram NOT accurately drawn



(a) Calculate the distance PR. **(2)**

.....

(b) Calculate the bearing of R from P, giving your answer to the nearest degree. **(3)**

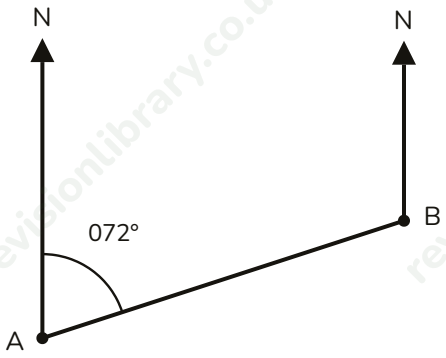
.....

(Total for Question 11 is 5 marks)

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12 On a map with scale 1 : 50,000, the distance between town A and town B is 8.4 cm. The bearing of town B from town A is 072.

Diagram NOT accurately drawn



(a) Calculate the real-life distance AB, giving your answer in km. **(2)**

.....

(b) State the bearing of town A from town B. **(2)**

(Total for Question 12 is 4 marks)

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13 Show that if two points A and B have the same northing (i.e. lie on the same east-west line) and a third point C has bearing 090 degrees from A and bearing 270 degrees from B, then AC + BC = AB. You must give a clear geometric argument and state any angle facts used. (6 marks)

(Total for Question 13 is 6 marks)

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Mark scheme · 4.16 Bearings: 1-hour Pack

Question 1

(a) 045 cao **B1**

(a) Answer: 045

(b) 180 cao **B1**

(b) Answer: 180

(c) 225 cao **B1**

(c) Answer: 225

(d) 270 cao **B1**

(d) Answer: 270

Question 2

(a) 090 cao **B1**

(a) Answer: 090

(b) 180 cao **B1**

(b) Answer: 180

(c) 225 cao **B1**

(c) Answer: 225

(d) 315 cao **B1**

(d) Answer: 315

Question 3

(a) 040 cao **B1**

(a) Answer: 040

(b) 155 cao **B1**

(b) Answer: 155

(c) 240 cao **B1**

(c) Answer: 240

(d) 290 cao **B1**

(d) Answer: 290

Question 4

since the bearing X->Y is 180 or more, subtract 180: 300 - 180 **M1**

120 degrees cao **A1**

Answer: 120 degrees

Question 5

recognise angle AWB is the difference between the two bearings measured from the same point W **M1**

162 - 072 = 90 degrees cao **A1**

clear final statement that angle AWB = 90 degrees cao **B1**

Answer: 90 degrees

Question 6

(a) 90 + 25 oe **M1**

(a) 115 cao **A1**

(a) Answer: 115

(b) 180 - 15 oe **M1**

(b) 165 cao **A1**

(b) Answer: 165

Question 7

6 / 2 oe **M1**

3 cm cao **A1**

Answer: 3 cm

Question 8

130 - 38 (= 92) oe, for angle AJB **M1**

(dep) 180 - 92 - 50 oe **M1**

38 degrees cao **A1**

Answer: 38 degrees

Question 9

038 + 180 oe **M1**

218 cao **A1**

Answer: 218

Question 10

210 - 180 oe **M1**

030 cao **A1**

Answer: 030

Question 11

(a) $8^2 + 6^2$ oe **M1**

(a) 10 km cao **A1**

(a) Answer: 10 km

(b) tan(angle) = 6/8 oe **M1**

(b) angle = $\tan^{-1}(6/8)$ **M1**

(b) awrt 037 (degrees) **A1**

(b) Answer: 037

Question 12

(a) 8.4 x 50000 (=420000) oe **M1**

(a) 4.2 km cao **A1**

(a) Answer: 4.2 km

(b) 072 + 180 oe **M1**

(b) 252 cao **A1**

(b) Answer: 252

Question 13

State that A and B lie on same east-west line so their northings are equal and AB is horizontal **M1**

Interpret bearings: C is on a line due east of A (bearing 090 from A) and due west of B (bearing 270 from B) **M1**

Conclude that C also lies on the same horizontal line as A and B (C has the same northing as A and B), so A, C and B are collinear **M1**

State that since C is east of A and west of B, C must lie between A and B on this shared line (not beyond either end) **M1**

Conclude AC + CB = AB, since C lies on the segment AB, with a clear reason cao **A1**

Full, logical explanation using angle facts (090/270 bearings give directions along the same east-west line) leading to AC + CB = AB **B1**

Answer: As above: AC + CB = AB, since C lies between A and B on the shared east-west line.

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