

Bearings

Foundation and Higher tiers

Total marks: 45

Marks

- M** Method mark, for a correct method. It can be implied by a correct answer.
- A** Accuracy mark, for a correct answer. It needs the method mark before it.
- B** A mark for a correct value or statement, with or without working.
- ft** Follow through: the mark is given for using an earlier wrong answer correctly.
- oe** Or equivalent.
- [a, b]** Any value from a to b inclusive.

Questions

Q	Skill	Spec	Tier	Grade	Calculator	Marks
1	Three-figure bearings	G15	Foundation	2	No	2
2	Measuring a bearing on a map	G15	Foundation	3	No	3
3	Drawing bearings	G15	Foundation	3	No	2
4	Back bearings, a decision	G15	Foundation	4	No	2
5	Position from two bearings	G15	Foundation	4	No	2
6	Bearings with angle facts	G15 G3	Foundation	5	No	3
7	Bearings in an isosceles triangle	G15 G4	Foundation	5	No	4
8	Scale drawing with bearings	G15	Foundation	5	No	3
9	Back bearings, forming an equation	G15 A17	Common	5	No	3
10	Bearings with trigonometry	G15 G20	Common	5	Yes	3
11	Bearings with trigonometry, a decision	G15 G20	Common	6	Yes	3
12	Bearings with the sine rule	G15 G22	Higher	7	Yes	4
13	Bearings with Pythagoras and trigonometry	G15 G20	Common	7	Yes	5
14	Bearings with the cosine and sine rules	G15 G22	Higher	8	Yes	6
	Total					45

Question 1 G15 · Foundation · Grade 2 · 2 marks

Q	Answer	Mark	Comments
1(a)	090°	B1	accept 090
1(b)	228°	B1	

Question 2 G15 · Foundation · Grade 3 · 3 marks

Q	Answer	Mark	Comments
2(a)	117°	B1	accept [115°, 119°]
2(b)	6.2×2	M1	their measurement of AB in cm $\times 2$, AB in [6.0, 6.4]
	12.4	A1	accept [12, 12.8]

Question 3 G15 · Foundation · Grade 3 · 2 marks

Q	Answer	Mark	Comments
3(a)	line from P on a bearing of 304°	B1	$\pm 2^\circ$
3(b)	cross 4 cm from P on a bearing of 155°	B1	± 2 mm and $\pm 2^\circ$

Question 4 G15 · Foundation · Grade 4 · 2 marks

Q	Answer	Mark	Comments
4	$38 + 180$	M1	oe, a sketch with both north lines
	No and 218°	A1	accept 218

Question 5 G15 · Foundation · Grade 4 · 2 marks

Q	Answer	Mark	Comments
5	a line from L on a bearing of 052° or a line from T on a bearing of 285°	B1	$\pm 2^\circ$
	S marked where both lines cross	B1	$\pm 2^\circ$

Question 6 G15 G3 · Foundation · Grade 5 · 3 marks

Q	Answer	Mark	Comments
6	$63 + 180$ or 243	M1	oe, or $180 - 63 = 117$ (co-interior angles)
	$243 - 104$	M1	oe, or $117 + 104 = 221$ and $360 - 221$
	139°	A1	accept 139

Question 7 G15 G4 · Foundation · Grade 5 · 4 marks

Q	Answer	Mark	Comments
7	angle BAC = $150 - 70$ or 80	M1	
	angle ABC = $(180 - 80) \div 2$ or 50	M1	ft their 80
	$70 + 180 - 50$	M1	oe, $250 - \text{their } 50$
	200°	A1	accept 200

Question 8 G15 · Foundation · Grade 5 · 3 marks

Q	Answer	Mark	Comments
8(a)	HB drawn 6 cm on a bearing of 040°	B1	± 2 mm and $\pm 2^\circ$
	BC drawn 4 cm on a bearing of 125°	B1	± 2 mm and $\pm 2^\circ$, with a north line at B or a correct angle
8(b)	7.5	B1ft	accept [7.3, 7.7], ft their drawing

Question 9 G15 A17 · Common · Grade 5 · 3 marks

Q	Answer	Mark	Comments
9	$b + 180 = 3b$	M1	oe, the back bearing of b is $b + 180$
	$2b = 180$	M1	oe, or trials of a bearing and its back bearing
	090°	A1	accept 90

Question 10 G15 G20 · Common · Grade 5 · 3 marks

Q	Answer	Mark	Comments
10	$\tan x = \frac{85}{120}$	M1	oe, x the angle at A
	$\tan^{-1}(\frac{85}{120})$ or 35.31...	M1	oe
	035°	A1	accept 35

Question 11 G15 G20 · Common · Grade 6 · 3 marks

Q	Answer	Mark	Comments
11	angle $180 - 148 = 32$ at A from south	M1	oe, or uses 148 directly
	$9.5 \times \sin 32$	M1	oe, $9.5 \times \cos 58$
	Yes and 5.03...	A1	accept 5.03 or 5.034 with Yes

Question 12 G15 G22 · Higher · Grade 7 · 4 marks

Q	Answer	Mark	Comments
12	angle SAB = 38 or angle SBA = 40	M1	may be on the diagram
	angle ASB = 180 – 38 – 40 or 102	M1	
	$\frac{AS}{\sin 40} = \frac{12}{\sin 102}$	M1	oe, ft their angles
	7.9	A1	accept 7.9 or [7.88, 7.89]

Question 13 G15 G20 · Common · Grade 7 · 5 marks

Q	Answer	Mark	Comments
13(a)	$3.4^2 + 2.1^2$ or 15.97	M1	oe, angle SXF = 90°
	4.0	A1	accept 4.0 or [3.99, 4.00]
13(b)	$\tan^{-1}(\frac{3.4}{2.1})$ or 58.3...	M1	oe, angle SFX, or $\tan^{-1}(\frac{2.1}{3.4}) = 31.7...$ for angle FSX
	140 – 58.3...	M1	oe, the bearing of X from F is 140°, or 230 – 180 + 31.7...
	082°	A1	accept 82 or [81.6, 81.8]

Question 14 G15 G22 · Higher · Grade 8 · 6 marks

Q	Answer	Mark	Comments
14(a)	angle AHB = 82°	B1	may be on a diagram
	$17^2 + 24^2 - 2 \times 17 \times 24 \times \cos 82$	M1	oe, ft their angle AHB
	27.4	A1	accept 27.4 or [27.41, 27.42]
14(b)	$\frac{\sin HAB}{24} = \frac{\sin 82}{27.41...}$	M1	oe, or the cosine rule for angle HAB, ft their AB
	angle HAB = 60.1...	A1	
	168°	A1ft	228 – their angle HAB, accept 168 or [167.8, 168.0]