4.19 Bearings and Scale: 2-hour Pack

Calculators not allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A plan of a room uses a scale of 1 : 20. The room is 6 m long in real life. How long is the room on the plan? Give your answer in centimetres.

(2)

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2 A walker is facing East and turns clockwise through 135°. In which direction is the walker now facing? Give the compass direction.

(2)

---

3 The bearing of B from A is 031°. The bearing of C from B is 304°. Work out the size of angle ABC.

(3)

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4 A scale drawing uses a scale of 5 cm to 10 m. A building is 240 m tall. How tall is the building on the drawing?

(2)

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5 A plan of a room uses a scale of 1 : 20. The room is 3 m long in real life. How long is the room on the plan? Give your answer in centimetres.

(2)

---

6 The bearing of B from A is 126°. The bearing of C from B is 267°. Work out the size of angle ABC.

(3)

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7 A walker is facing South and turns clockwise through 225°. In which direction is the walker now facing? Give the compass direction.

(2)

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8 A ship sails from port P on a bearing of 059°. It then turns and sails directly back to P. On what bearing does it sail on the return journey? Give your answer as a three-figure bearing.

(2)

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9 A scale drawing uses a scale of 5 cm to 20 m. A building is 580 m tall. How tall is the building on the drawing?

(2)

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10 A scale drawing uses a scale of 1 cm to 20 m. A building is 180 m tall. How tall is the building on the drawing?

(2)

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11 The bearing of B from A is 076°. The bearing of C from B is 230°. Work out the size of angle ABC.

(3)

---

12 A walker is facing West and turns clockwise through 180°. In which direction is the walker now facing? Give the compass direction.

(2)

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13 The bearing of B from A is 040°. The bearing of C from B is 213°. Work out the size of angle ABC.

(3)

---

14 A map has a scale of 1 : 1000. Two towns are 7.4 cm apart on the map. Work out the real distance between the towns. Give your answer in m.

(2)

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15 The bearing of B from A is 071°. The bearing of C from B is 332°. Work out the size of angle ABC.

(3)

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16 A scale drawing uses a scale of 2 cm to 5 m. A wall is 15 cm long on the drawing. Work out the real length of the wall.

(2)

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17 A plan of a room uses a scale of 1 : 20. The room is 5.4 m long in real life. How long is the room on the plan? Give your answer in centimetres.

(2)

---

18 The bearing of B from A is 033°. The bearing of C from B is 206°. Work out the size of angle ABC.

(3)

---

19 A walker is facing West and turns clockwise through 315°. In which direction is the walker now facing? Give the compass direction.

(2)

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20 A walker is facing South and turns clockwise through 90°. In which direction is the walker now facing? Give the compass direction.

(2)

---

21 A bearing is given as 306. What is the bearing measured anti-clockwise from north to the same direction? Give your answer as a three-figure bearing.

(2)

---

22 A scale drawing uses a scale of 5 cm to 20 m. A building is 220 m tall. How tall is the building on the drawing?

(2)

---

23 The bearing of B from A is 251°. Work out the bearing of A from B.

(2)

---

24 A plan of a room uses a scale of 1 : 20. The room is 3.8 m long in real life. How long is the room on the plan? Give your answer in centimetres.

(2)

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25 A map has a scale of 1 : 2000. A path is 154 m long in real life. How long is it on the map in centimetres?

(3)

---

26 The bearing of B from A is 072°. Work out the bearing of A from B.

(2)

---

27 A map has a scale of 1 : 100000. A lake is 3.4 cm wide on the map. Work out its real width in metres.

(3)

---

28 The bearing of B from A is 104°. Work out the bearing of A from B.

(2)

---

29 On a scale drawing 1 cm represents 500 m. Calculate the drawing length in centimetres for a real distance of 2.5 km.

(2)

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30 A scale drawing uses a scale of 5 cm to 2 m. A building is 40 m tall. How tall is the building on the drawing?

(2)

---

31 A map uses scale 1:40 000. A straight road measures 7.5 cm on the map. Work out the real distance in kilometres.

(3)

---

32 A sketch map shows two towns A and B. On the map, the bearing from A to B is 205 and the map distance is 3 cm. The scale is 1 cm to 1.5 km. Give the three-figure bearing of A from B and the real distance in km.

(2)

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33 A surveyor draws a plan with scale 1:300. A garden measures 9 m by 6 m in reality. What are the dimensions on the plan in centimetres?

(2)

---

34 A ship sails due north. Write down the bearing you would follow to sail directly back the way it came.

(1)

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35 A ship at sea is at bearing 158 from lighthouse L. Another ship is at bearing 073 from the same lighthouse. Calculate the acute angle between the two ships as seen from the lighthouse.

(3)

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36 A map shows three villages X, Y and Z. The bearing from X to Y is 134 and the bearing from X to Z is 298. Work out the size of the angle YXZ (angle at X between lines to Y and Z). State whether it is reflex or not, giving reasoning.

(3)

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37 A coastal surveyor stands at point T and measures bearings to four buoys: A 038, B 127, C 214 and D 309. On a large map she plots T at the centre and draws lines at these bearings. She needs to label the clockwise order of buoys starting from the smallest bearing. Give the order and explain whether any two adjacent buoys are less than 90 degrees apart.

(3)

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38 Give the three-figure bearing of the direction shown: from C to D is directly west.

(1)

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39 Write down the bearing from P to Q if Q is 65 degrees clockwise from north of P.

(2)

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40 A ship sails from port N on a bearing of 248. What is the bearing back from the ship to port N?

(2)

---

41 On a map, road R goes from village V to town T. The bearing from V to T is 316. A cyclist at V rides on a bearing of 072 for a while. Calculate the smaller angle between the cyclist's direction and the direction to T from V.

(2)

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Mark scheme · 4.19 Bearings and Scale: 2-hour Pack

Question 1

6 x 100 = 600 cm, then ÷ 20	M1
30 cm cao	A1

Answer: **30 cm**

Question 2

90 + 135 = 225 (mod 360)	M1
South West cao	A1

Answer: **South West**

Question 3

bearing of A from B = 211°	M1
difference between 211 and 304 (and a reflex angle converted if needed)	M1
93° cao	A1

Answer: **93°**

Question 4

240 ÷ 10 x 5	M1
120 cm cao	A1

Answer: **120 cm**

Question 5

3 x 100 = 300 cm, then ÷ 20	M1
15 cm cao	A1

Answer: **15 cm**

Question 6

bearing of A from B = 306°	M1
difference between 306 and 267 (and a reflex angle converted if needed)	M1
39° cao	A1

Answer: **39°**

Question 7

180 + 225 = 405 (mod 360)	M1
North East cao	A1

Answer: **North East**

Question 8

59 + 180	M1
239° cao	A1

Answer: **239°**

Question 9

580 ÷ 20 x 5	M1
145 cm cao	A1

Answer: **145 cm**

Question 10

180 ÷ 20 x 1	M1
9 cm cao	A1

Answer: **9 cm**

Question 11

bearing of A from B = 256°	M1
difference between 256 and 230 (and a reflex angle converted if needed)	M1
26° cao	A1

Answer: **26°**

Question 12

270 + 180 = 450 (mod 360)	M1
East cao	A1

Answer: **East**

Question 13

bearing of A from B = 220°	M1
difference between 220 and 213 (and a reflex angle converted if needed)	M1
7° cao	A1

Answer: **7°**

Question 14

7.4 x 1000	M1
74 m cao	A1

Answer: **74 m**

Question 15

bearing of A from B = 251°	M1
difference between 251 and 332 (and a reflex angle converted if needed)	M1
81° cao	A1

Answer: **81°**

Question 16

15 ÷ 2 x 5 or 15 x 2.5	M1
37.5 m cao	A1

Answer: **37.5 m**

Question 17

5.4 x 100 = 540 cm, then ÷ 20	M1
27 cm cao	A1

Answer: **27 cm**

Question 18

bearing of A from B = 213°	M1
difference between 213 and 206 (and a reflex angle converted if needed)	M1
7° cao	A1

Answer: **7°**

Question 19

270 + 315 = 585 (mod 360)	M1
South West cao	A1

Answer: **South West**

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Question 20

180 + 90 = 270 (mod 360)	**M1**
West cao	**A1**

Answer: **West**

Question 21

understands anti-clockwise is reverse direction: compute 360 - 306 = 54	**M1**
054 cao	**A1**

Answer: **054**

Question 22

220 ÷ 20 x 5	**M1**
55 cm cao	**A1**

Answer: **55 cm**

Question 23

251 - 180	**M1**
071° cao	**A1**

Answer: **071°**

Question 24

3.8 x 100 = 380 cm, then ÷ 20	**M1**
19 cm cao	**A1**

Answer: **19 cm**

Question 25

154 x 100 = 15400 cm	**M1**
÷ 2000	**M1**
7.7 cm cao	**A1**

Answer: **7.7 cm**

Question 26

72 + 180	**M1**
252° cao	**A1**

Answer: **252°**

Question 27

3.4 x 100000	**M1**
converts cm to m by ÷ 100	**M1**
3400 m cao	**A1**

Answer: **3400 m**

Question 28

104 + 180	**M1**
284° cao	**A1**

Answer: **284°**

Question 29

converts 2.5 km to metres 2500 m and divides by 500 to find 5 cm or uses ratio 2.5/0.5	**M1**
5 cm cao	**A1**

Answer: **5 cm**

Question 30

40 ÷ 2 x 5	**M1**
100 cm cao	**A1**

Answer: **100 cm**

Question 31

converts map cm to real cm: 7.5 x 40 000 = 300 000 cm or uses 7.5 x 400 = 3000 m	**M1**
converts cm to metres then to km correctly	**M1**
3 km cao	**A1**

Answer: **3 km**

Question 32

knows reciprocal bearing is 025, from 205 - 180 = 025	**M1**
025 and 4.5 km (accept 025 degrees)	**A1**

Answer: **025 and 4.5 km**

Question 33

converts metres to cm and divides by 300: 900 cm/300 = 3 and 600 cm/300 = 2	**M1**
3 cm by 2 cm cao	**A1**

Answer: **3 cm by 2 cm**

Question 34

180 cao	**B1**

Answer: **180**

Question 35

sets up the correct subtraction of the two bearings	**M1**
finds difference: 158 - 073 = 85	**M1**
85 degrees cao	**A1**

Answer: **85 degrees**

Question 36

finds difference using bearings: 298 - 134 = 164	**M1**
164 degrees cao	**A1**
states not reflex, since 164 degrees is less than 180 degrees (it is obtuse)	**A1**

Answer: **164 degrees; obtuse, not reflex (less than 180 degrees)**

Question 37

lists bearings in ascending order: 038, 127, 214, 309	**M1**
gives clockwise order of buoys as A, B, C, D	**M1**
checks adjacent differences: 089, 087, 095, 089 and states that A-B, B-C and D-A are less than 90 degrees apart while C-D is not	**A1**

Answer: **Order: A, B, C, D. Adjacent differences: A-B 89 degrees, B-C 87 degrees, C-D 95 degrees, D-A 89 degrees; three of the four adjacent pairs (A-B, B-C, D-A) are less than 90 degrees apart**

Question 38

270 cao	**B1**

Answer: **270**

Question 39

understands bearing measured clockwise from north and calculates 0 + 65 = 065	**M1**
065 cao	**A1**

Answer: **065**

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Question 40

subtracts 180 degrees to find opposite direction: 248 - 180 = 68 **M1**

068 cao **A1**

Answer: **068**

Question 41

method to find difference using clockwise bearings: 316 - 072 = 244, then 360 - 244 = 116 **M1**

116 degrees cao **A1**

Answer: **116 degrees**

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