4.19 Bearings and Scale: 30-minute Pack

Calculators not allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A ship at sea is at bearing 157 from lighthouse L. Another ship is at bearing 070 from the same lighthouse. Calculate the acute angle between the two ships as seen from the lighthouse.

(2)

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2 A coastal surveyor stands at point T and measures bearings to four buoys: A 045, B 140, C 225 and D 320. 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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3 A scale drawing uses a scale of 1 cm to 20 m. A building is 160 m tall. How tall is the building on the drawing?

(2)

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4 Give the three-figure bearing of the direction shown: from A to B is directly south.

(1)

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5 The bearing of B from A is 129°. The bearing of C from B is 234°. Work out the size of angle ABC.

(3)

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6 Write down the three-figure bearing of North.

(1)

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7 A scale drawing uses a scale of 5 cm to 2 m. Write the scale in the form 1 : n.

(3)

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8 On a map with scale 1:150 000, two landmarks are 3.6 km apart in reality. Find the distance between them on the map in centimetres. Show the conversion steps.

(3)

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9 A town P is due north of town Q. A car drives from Q on a bearing of 048 and another car drives from Q on a bearing of 142. Which car is closer in direction to P? Justify your answer with a calculation.

(3)

10 A plane flies from airport S to airport T on a bearing of 085. Another plane flies from T to U on a bearing of 268. Are these two bearings reciprocals? Explain briefly.

(2)

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Mark scheme · 4.19 Bearings and Scale: 30-minute Pack

Question 1

finds difference: 157 - 070 = 87 or 070 - 157 = -87 then takes absolute value	M1
87 degrees cao	A1

Answer: **87 degrees**

Question 2

lists bearings in ascending order: 045, 140, 225, 320	M1
gives clockwise order of buoys as A, B, C, D	M1
checks adjacent differences: 095, 085, 095, 085 and states that B and C are 85 degrees apart (less than 90), D and A are also 85 degrees apart going through north, and A-B and C-D are 95 degrees apart	A1

Answer: **Order: A, B, C, D. Adjacent differences: A-B 95 degrees, B-C 85 degrees (less than 90), C-D 95 degrees, D-A 85 degrees (less than 90 for D-A if going via 360)**

Question 3

160 ÷ 20 x 1	M1
8 cm cao	A1

Answer: **8 cm**

Question 4

180 cao	B1

Answer: **180**

Question 5

bearing of A from B = 309°	M1
difference between 309 and 234 (and a reflex angle converted if needed)	M1
75° cao	A1

Answer: **75°**

Question 6

000° cao	B1

Answer: **000°**

Question 7

2 m = 200 cm	M1
200 ÷ 5	M1
1 : 40 cao	A1

Answer: **1 : 40**

Question 8

converts 3.6 km to cm: 3.6 x 100 000 = 360 000 cm	M1
divides by scale 150 000 to get map cm: 360 000 / 150 000 = 2.4	M1
2.4 cm cao	A1

Answer: **2.4 cm**

Question 9

computes differences from north (000): |048 - 000| = 48 and |142 - 000| = 142	M1
correctly compares the two differences	A1
car on 048 is closer to P because 48 degrees < 142 degrees	A1

Answer: **The car on 048; 48 degrees from north compared with 142 degrees**

Question 10

shows method: adds 180 to 085, giving 265 (or compares 268)	M1
statement that they are not reciprocals because reciprocal of 085 is 265, not 268	A1

Answer: **No; reciprocal of 085 is 265, not 268**

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