

1.

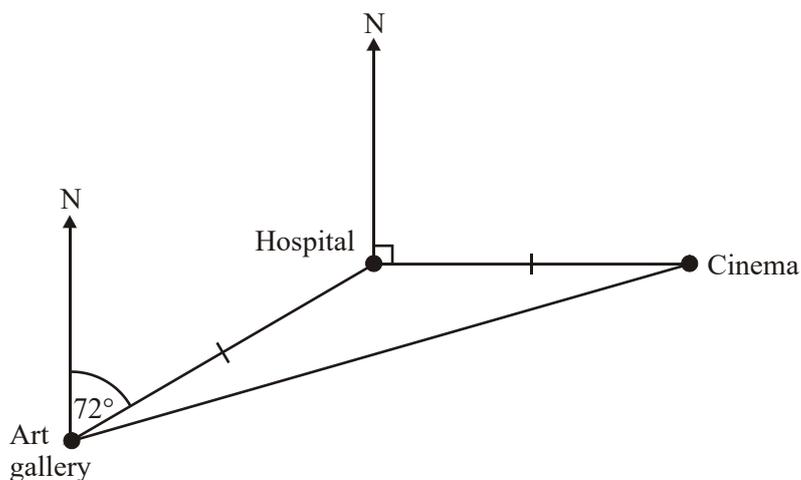


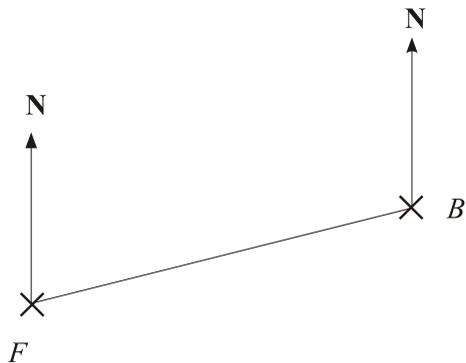
Diagram **NOT** accurately drawn

The diagram shows the position of each of three buildings in a town.  
 The bearing of the Hospital from the Art gallery is  $072^\circ$ .  
 The Cinema is due East of the Hospital.  
 The distance from the Hospital to the Art gallery is equal to the distance from the Hospital to the Cinema.

Work out the bearing of the Cinema from the Art gallery.

.....<sup>o</sup>  
 (Total 3 marks)

2. The diagram shows the position of a farm  $F$  and a bridge  $B$  on a map.



- (a) Measure and write down the bearing of  $B$  from  $F$ .

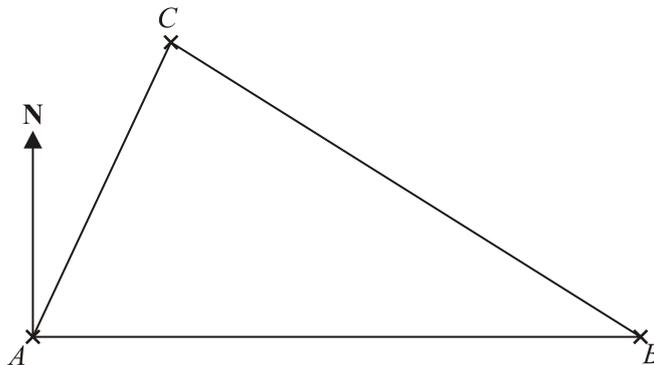
.....° (1)

A church  $C$  is on a bearing of  $155^\circ$  from the bridge  $B$ .  
On the map, the church is 5 cm from  $B$ .

- (b) Mark the church with a cross (✕) and label it  $C$ .

(2)  
(Total 3 marks)

3.



The crosses on the diagram show the positions of three places  $A$ ,  $B$  and  $C$ .

The scale of the diagram is 1 cm to 5 km.

(a) Find the actual distance between  $A$  and  $B$ .

..... km (1)

(b) Measure the bearing of  $C$  from  $A$ .

..... (1)

$D$  is a fourth place.

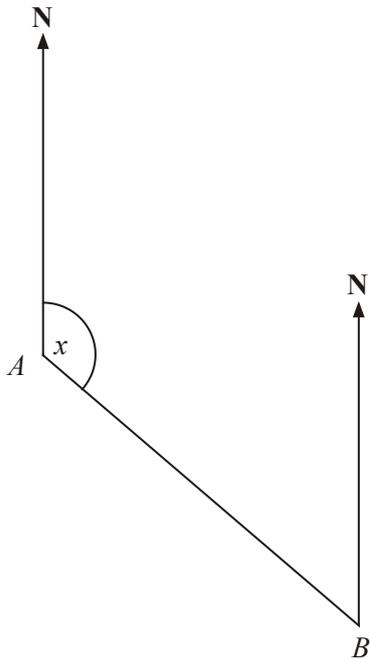
The actual distance of  $D$  from  $A$  is 20 km.

The bearing of  $D$  from  $A$  is  $115^\circ$ .

(c) Mark with a cross ( $\times$ ) the position of  $D$  on the diagram. Label the point  $D$ .

(2)  
(Total 4 marks)

4. The diagram shows the position of two airports, *A* and *B*.  
A plane flies from airport *A* to airport *B*.



Scale: 1 cm represents 50 km

- (a) Measure the size of the angle marked *x*.

.....° (1)

- (b) Work out the real distance between airport *A* and airport *B*.  
Use the scale 1 cm represents 50 km.

..... km (2)

Airport  $C$  is 350 km on a bearing of  $060^\circ$  from airport  $B$ .

- (c) On the diagram, mark airport  $C$  with a cross ( $\times$ ).  
Label it  $C$ .

(2)  
(Total 5 marks)

5. The diagram shows the position of two boats,  $P$  and  $Q$ .

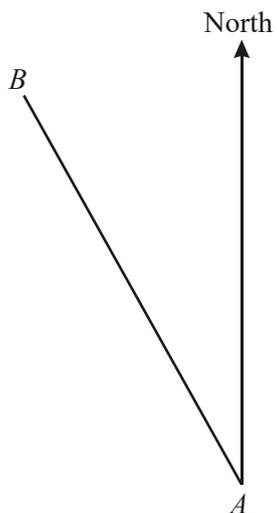


The bearing of a boat  $R$  from boat  $P$  is  $060^\circ$   
The bearing of boat  $R$  from boat  $Q$  is  $310^\circ$

In the space above, draw an accurate diagram to show the position of boat  $R$ .  
Mark the position of boat  $R$  with a cross ( $\times$ ). Label it  $R$ .

(Total 3 marks)

6.



(a) Measure and write down the bearing of  $B$  from  $A$ .

.....° (1)

(b) On the diagram, draw a line on a bearing of  $107^\circ$  from  $A$ .

(1)  
(Total 2 marks)

7. The diagram shows the positions of two ships,  $A$  and  $B$ .



A ship  $C$  is on a bearing of  $064^\circ$  from ship  $A$ .  
 Ship  $C$  is also on a bearing of  $290^\circ$  from ship  $B$ .

In the space above, draw an accurate diagram to show the position of ship  $C$ .  
 Mark the position of ship  $C$  with a cross  $\times$ . Label it  $C$ .

(Total 3 marks)

- 8.

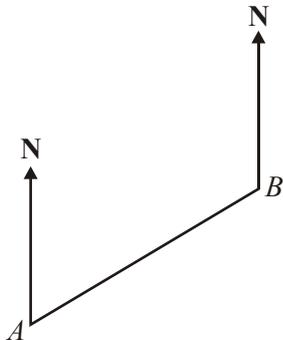


Diagram **NOT** accurately drawn

The bearing of  $B$  from  $A$  is  $035^\circ$ .  
Work out the bearing of  $A$  from  $B$ .

$035^\circ$   
A

$055^\circ$   
B

$145^\circ$   
C

$215^\circ$   
D

$325^\circ$   
E

(Total 1 mark)

9.

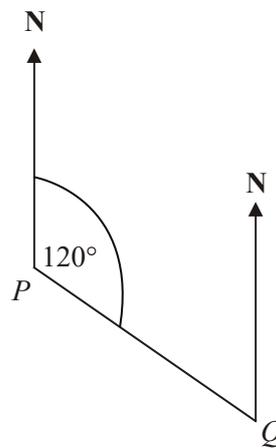


Diagram **NOT** accurately drawn

The bearing of  $Q$  from  $P$  is  $120^\circ$ .

What is the bearing of  $P$  from  $Q$ ?

$240^\circ$   
A

$120^\circ$   
B

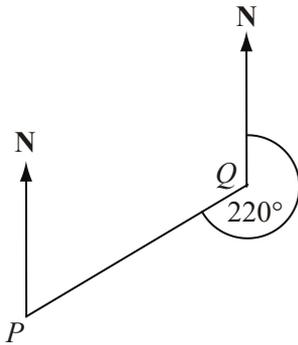
$030^\circ$   
C

$060^\circ$   
D

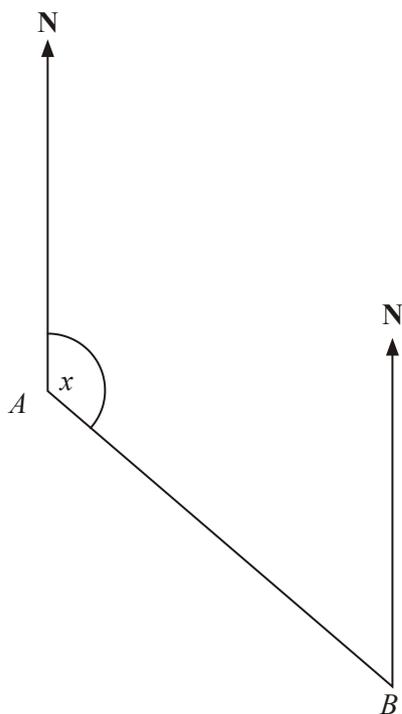
$300^\circ$   
E

(Total 1 mark)

10.

Diagram **NOT** accurately drawnThe bearing of  $P$  from  $Q$  is  $220^\circ$ What is the bearing of  $Q$  from  $P$ ? $140^\circ$ **A** $130^\circ$ **B** $040^\circ$ **C** $050^\circ$ **D** $060^\circ$ **E****(Total 1 mark)**

11. The diagram shows the position of two airports, *A* and *B*.  
A plane flies from airport *A* to airport *B*.



Scale: 1 cm represents 50 km

- (a) Measure the size of the angle marked *x*.

..... ° (1)

- (b) Work out the real distance between airport *A* and airport *B*.  
Use the scale 1 cm represents 50 km.

..... km (2)

Airport  $C$  is 350 km on a bearing of  $060^\circ$  from airport  $B$ .

- (c) On the diagram, mark airport  $C$  with a cross ( $\times$ ).  
Label it  $C$ .

(2)  
(Total 5 marks)

12.

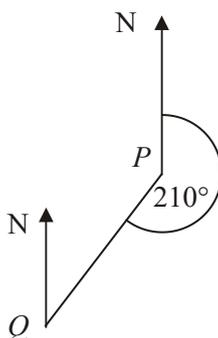


Diagram **NOT** accurately drawn

The bearing of  $Q$  from  $P$  is  $210^\circ$

What is the bearing of  $P$  from  $Q$ ?

$040^\circ$

$150^\circ$

$030^\circ$

$50^\circ$

$060^\circ$

**A**

**B**

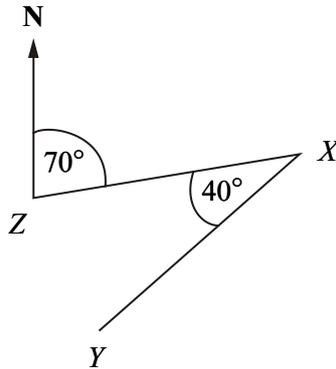
**C**

**D**

**E**

(Total 1 mark)

13.

Diagram **NOT** accurately drawn

$X$ ,  $Y$  and  $Z$  are 3 points.

The bearing of  $X$  from  $Z$  is  $070^\circ$ .

Angle  $YXZ = 40^\circ$ .

Work out the bearing of  $Y$  from  $X$ .

110°

040°

030°

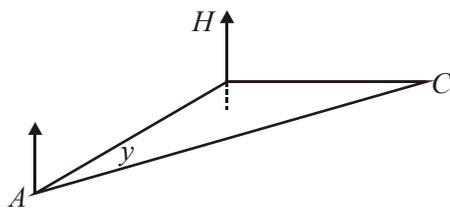
230°

210°

**A****B****C****D****E****(Total 1 mark)**

1. 081 or 81

3



$$x = 72^\circ$$

$$y = \frac{180 - 162}{2} = 9^\circ$$

$$72^\circ + 9^\circ = 81^\circ$$

*MI for (AHC=) 90 + 72 (=162) accept x marked as 72 and CHS as 90 or symbol*

*MI dep for  $\frac{(y=)180 - "162"}{2} (= 9)$*

*Al cao*

*ALTn Draws line from A parallel to HC*

*MI for z = w and y + z = 90 - 72 (= 18)*

*MI for y (or z) =  $\frac{"18"}{2}$*

*Al cao*

[3]

2. (a) (0)76

1

*B1 for (0)76°(±2°)*

(b)

2

*B1 for a pt marked on a bearing of 155° (±2°) from B*

*or*

*a line on a bearing of 155° ± 2°*

*B1 for a point 5 cm (±2 mm) from B or a line of length 5 cm (±2 mm) from B*

[3]

3. (a)  $8 \times 5 = 40$  km

1

*B1 accept answers from 39 to 41*

(b)  $023^\circ - 027^\circ$ 

1

*B1 accept answers from 23° to 27°*

	(c)	D correct <i>B2 cao (B1 D either 4 cm <math>\pm 2</math>mm from A or on correct bearing from A, <math>115^\circ \pm 2^\circ</math>)</i>	2	
				[4]
4.	(a)	129 – 133 <i>B1 for 129 – 133</i>	1	
	(b)	$6 \times 50$ 290 – 310 <i>B2 for 290 – 310 (B1 for <math>6 \pm 0.2</math> (cm) seen or for <math>d \times 50</math> with <math>3 \leq d \leq 9</math>)</i>	2	
	(c)	Point C marked <i>B1 for <math>BC = 7 \pm 0.2</math> cm B1 for bearing = <math>60 \pm 2^\circ</math></i>	2	
				[5]
5.	diagram	<i>M1 for line drawn or point marked within guidelines from P M1 for line drawn or point marked within guidelines from Q up to top guideline from P A1 for point indicated within region where guidelines intersect</i>	3	
				[3]
6.	(a)	$332 \pm 2$ <i>B1</i>	1	
	(b)	Draw $107^\circ \pm 2$ <i>B1</i>	1	
				[2]
7.		<i>M1 correct angle of <math>064^\circ \pm 2^\circ</math> M1 correct angle of <math>290^\circ \pm 2^\circ</math> A1 C at the intersection of their <b>drawn</b> bearings</i>	3	
				[3]

8. D [1]
9. E [1]
10. C [1]
11. (a) 129 – 133 1  
*B1 for 129 – 133*
- (b)  $6 \times 50$  2  
290 – 310  
*B2 for 290 – 310*  
*(B1 for  $6 \pm 0.2$  (cm) seen or for  $d \times 50$  with  $3 \leq d \leq 9$ )*
- (c) Point C marked 2  
*B1 for  $BC = 7 \pm 0.2$  cm*  
*B1 for bearing =  $60 \pm 2^\circ$*
- [5]
12. C [1]
13. E [1]

**1. Paper 3**

The majority of candidates found this question difficult and very few gained even part marks. Working out was rarely linked to the diagram in any way. Some candidates, for example, wrote '90 + 72 = 162' or '90 - 72 = 18' but did not clarify which angle they were referring to. Candidates should be encouraged to annotate diagrams to help describe which angles they are trying to calculate. Those who drew a line East from the Art gallery usually assumed, without any justification, that the line to the Cinema bisected the angle of 18°.

**Paper 5**

Although many obtained the correct sizes of the angles in the triangle it was not uncommon to see the bearing calculated about the point *C* rather than about the point *A*. Some good solutions were ruined by poor arithmetic, for example "18 ÷ 2 = 8". A common error amongst weaker candidates was to assume that the remaining angle of 270° about *H* was bisected so that angle *AHC* became 135°.

2. Just over 25% of candidates were able to give the correct bearing of *B* from *F* in part (a). Common incorrect answers were 256° (the bearing of *F* from *B*) and 104° (the obtuse angle at *B*). In part (b), the majority of candidates marked *C* 5 cm from *B* and accuracy in this measurement was good. However, only 30% of candidates obtained the mark for the bearing. Many did not appear to know that bearings are measured from north in a clockwise direction.
3. Part (a) was well answered, but in part (b) candidates were unsure as to where the angle should be measured from. Some measured *CAB*, and some *ACB*. In part (c) it was again the angle that proved the problem, since many candidates correctly plotted the point at the correct distance from *A*, but angles varied wildly.
4. In part (a) almost two thirds of candidates measured the size of the angle correctly. Many of the incorrect answers were less than 90°, suggesting that candidates had read from the wrong scale on the protractor. Part (b) was well answered with more than three quarters of candidates gaining both marks. Some of those who didn't gained one mark for showing the length *AB* to be 6 cm or for multiplying their length by 50. Quite a common incorrect response was 350, often with no working which meant that no mark could be awarded. Part (c) was poorly answered. Many candidates managed to mark a point 7 cm from *B* but relatively few managed to position it on a bearing of 060°. It was often positioned on a bearing of 030° as a result of the protractor being placed with the 90° line on the north line.
5. Weaker candidates could draw the 60° bearing but not 310°. A number used their protractor with the straight edge horizontal, effectively measuring bearings from an East-West line. Some candidates marked points correctly but then joined the two points up, thus losing the third mark. In some cases, the mid-point of this line was identified and labelled *R*.

6. It was clear to all examiners that nearly all the candidates had little idea of bearings. There were very few correct responses to both writing down and drawing the bearings. In (a) many candidates read the word 'measure', stopped reading, and gave an answer of 6cm by measuring the diagonal line. Others measured the acute angle on the diagram. In (b) it was common to see an angle of  $107^\circ$  drawn anywhere other than in the correct position.

7. **Foundation Tier**

The vast majority of the candidates did not understand the concept of bearings and that when drawing a bearing the angle should start from the North line. As a result over 66% of the candidates scored no marks for this question. Most candidates did put a cross somewhere in the answer space, generally above points *A* and *B* but it was rare to find a candidate scoring all 3 available marks. Many (27%) were able to draw one of the bearings accurately. Surprisingly, this was not always the accurate drawing of the  $64^\circ$  angle but often a  $70^\circ$  angle drawn anticlockwise from the North line at *B*. Most candidates did not draw in the bearing, merely putting a dot on the paper. As a result it was difficult for the candidate to find *C* accurately as they were not able to see the intersection of the two bearings. Many candidates drew a North line at *C* too, and not always as a vertical line! Only 2.5% of the candidates scored all 3 available marks for this question.

**Intermediate Tier**

Bearings are not done well, at this level; however just over half gained one mark for either one correct bearing drawn (usually  $064^\circ$ ) or recognising that the position of *C* was at the intersection of the two bearings. Many candidates constructed an angle of  $64^\circ$  from a horizontal line through *A* rather than from the vertical north line. Far too often candidates failed to actually construct a bearing line, leaving dots to indicate evidence of *some* understanding of bearings.

8. No Report available for this question.

9. No Report available for this question.

10. No Report available for this question.

11. 62% of the candidates were able to measure the size of the angle marked  $x$  within the tolerances.

In part (b) candidates earned a method mark for measuring the length of  $AB$  in centimetres (large tolerances were allowed) and then multiplying this by 50. Those that just wrote down an answer often failed to score the method mark as the examiners could not see what they had done. It was not uncommon to see an answer of 250 or 350 without working which scored no marks. A common incorrect response was to take their answer to (a) and multiply this by 50 demonstrating a complete lack of understanding of scale drawings. 78% of the candidates scored both marks in part (b).

Candidates at this level often struggle with bearings and this year was no exception with only 15% of the candidates scoring both marks in part (c). However 30% were able to score 1 mark generally for drawing a cross 7 cm from  $B$  although some did score 1 mark for a bearing of  $60^\circ$ . A common error was to measure  $60^\circ$  from point  $A$  instead of  $B$ . This did not score any marks.

12. No Report available for this question.

13. No Report available for this question.