

1. (a) In the space below, draw a line 12 cm long.

(1)

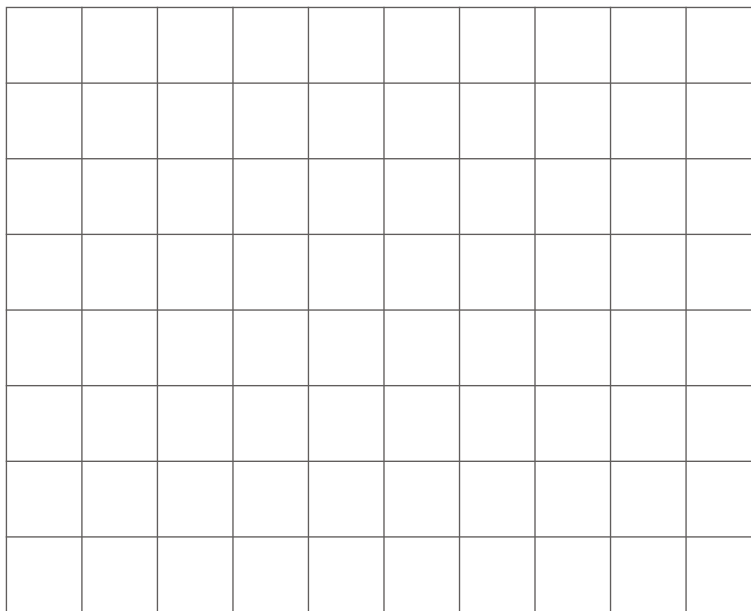
- (b) Find the point that is halfway along the line you have drawn.

Mark it with a cross (X)

(1)

Here is a grid of centimetre squares.

- (c) On the grid draw a rectangle that has length 6 cm and width 4 cm.



(1)

(Total 3 marks)

2. (a) Measure the length of the line.



(2)

The line is to be the **diameter** of a circle.

- (b) Mark the centre of the circle with a cross.

(1)

- (c) Draw the circle.

(1)

(Total 4 marks)

- 3.

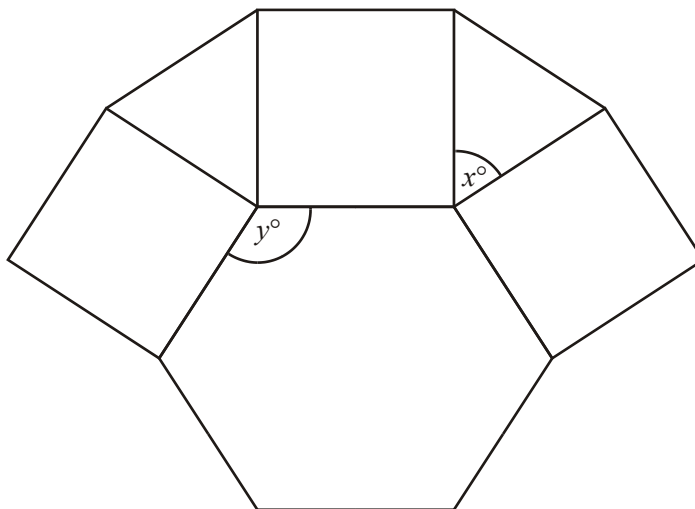


Diagram **NOT**  
accurately drawn

This is part of the design of a pattern found at the theatre of Diana at Alexandria.

It is made up of a regular hexagon, squares and equilateral triangles.

- (a) Write down the size of the angle marked  $x^\circ$ .

.....<sup>o</sup> (1)

- (b) Work out the size of the angle marked  $y^\circ$ .

.....<sup>o</sup> (2)

The area of each equilateral triangle is  $2 \text{ cm}^2$ .

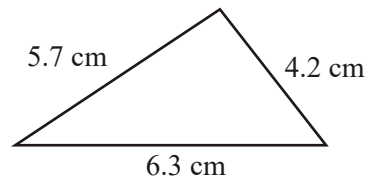
- (c) Work out the area of the regular hexagon.

..... $\text{cm}^2$  (2)

- (d) In the space below, use ruler and compasses to **construct** an equilateral triangle with sides of length 4 centimetres.  
You must show all construction lines.

(2)  
(Total 7 marks)

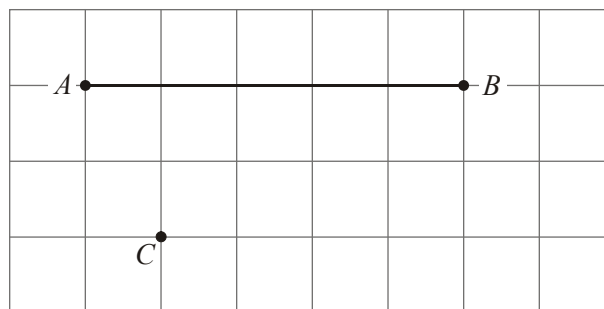
4. Here is a sketch of a triangle.



In the space below, use ruler and compasses to **construct** this triangle accurately. You must show all construction lines.

(Total 3 marks)

- 5.



- (a) On the grid, draw a line from the point  $C$  perpendicular to the line  $AB$ .

(1)

(b) Sketch a cylinder in the space below.

(1)  
(Total 2 marks)

6. The diagram shows a sketch of triangle  $ABC$ .

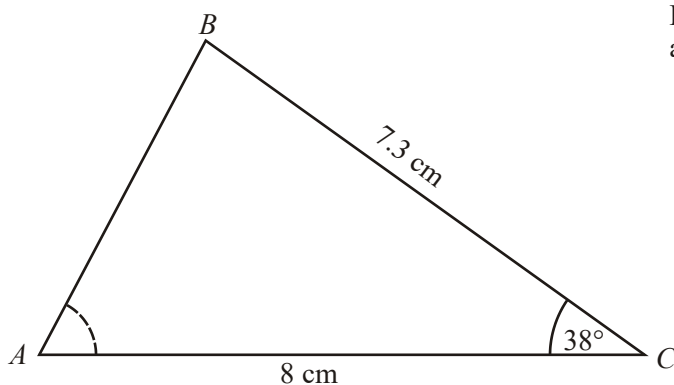


Diagram **NOT** accurately drawn

$BC = 7.3$  cm.  
 $AC = 8$  cm.  
 Angle  $C = 38^\circ$ .

- (a) Make an accurate drawing of triangle  $ABC$ . The line  $AC$  has been accurately drawn.



(2)

- (b) Measure the size of angle  $A$  on your diagram.

.....°

(1)

(Total 3 marks)

7. (a) Draw a line 6cm long in the space below.  
Start from the point labelled A.

A  
×

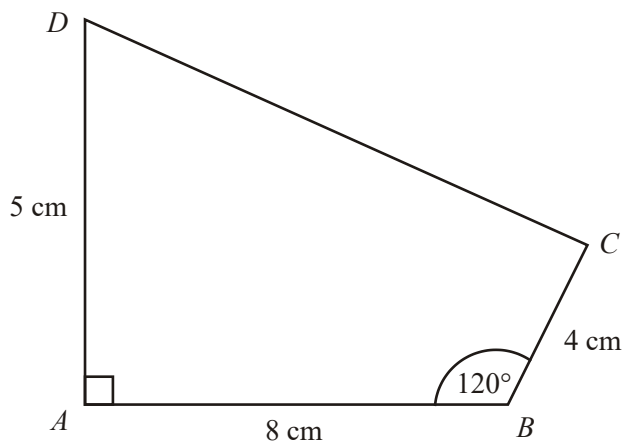
(1)

- (b) Mark with a cross (×), the point on your line which is 2 cm from the point A.

(1)  
(Total 2 marks)

8.

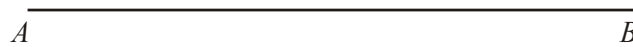
Diagram **NOT**  
accurately drawn





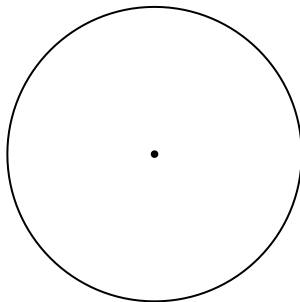
Make an accurate drawing of the quadrilateral  $ABCD$  in the space below.

The line  $AB$  has already been drawn for you.



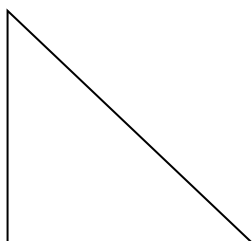
(Total 4 marks)

9. (a) In the circle, draw a diameter.



(1)

- (b) In the triangle, mark the right angle with a letter  $R$ .



(1)

(c) In the space below, draw a rectangle.

(1)  
(Total 3 marks)

10.

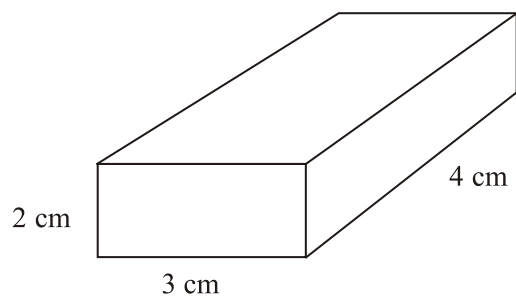
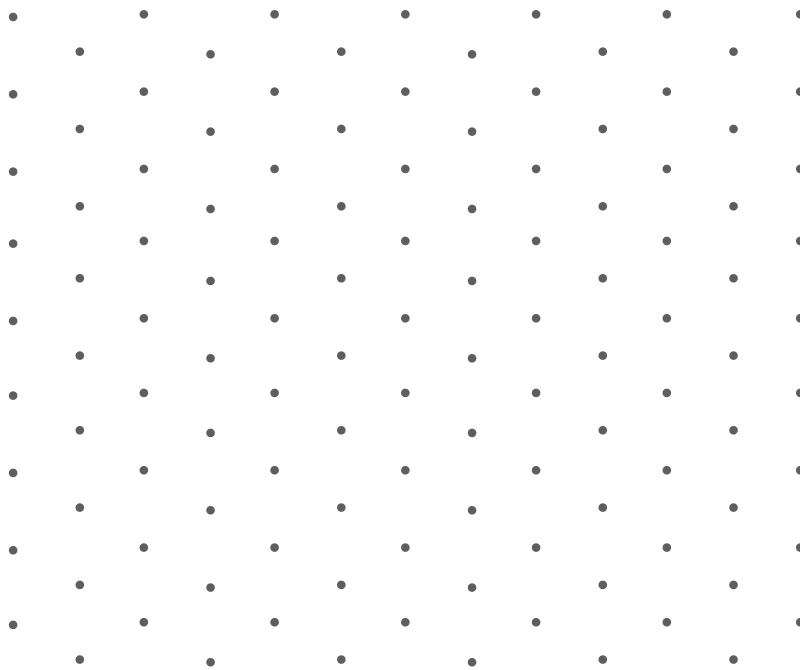


Diagram **NOT**  
accurately drawn

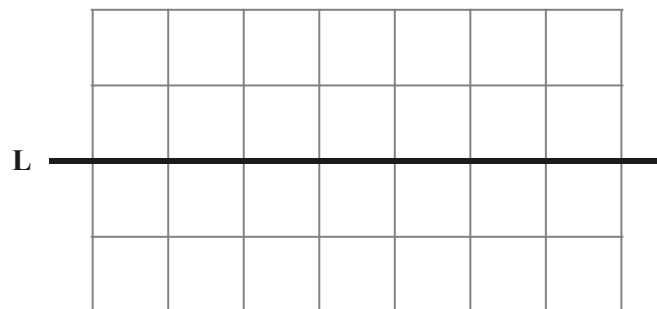
The diagram shows a solid cuboid.

On the isometric grid, make an accurate full size drawing of the cuboid.



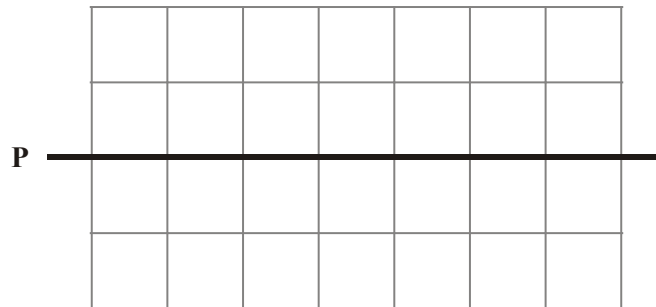
(Total 2 marks)

11. (a) On the grid, draw a line that is parallel to the line L.



(1)

- (b) On the grid, draw a line perpendicular to the line **P**.



(1)  
(Total 2 marks)

12. (a) Draw a line 7 cm long.  
Start from the point *A* marked with a cross.

*A* ×

(1)

- (b) Mark the midpoint of the line *PQ* with a cross (×).

*P* ————— *Q*

(1)

- (c) Draw the circle which has  $PQ$  as a diameter.

(1)  
(Total 3 marks)

13.

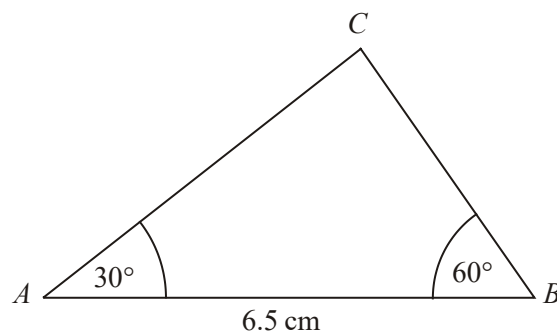


Diagram **NOT**  
accurately drawn

- (a) Make an accurate drawing of this triangle.  
The line  $AB$  has already been drawn for you.



(2)

- (b) Measure the length of the line  $AC$  on your drawing.  
You must state the units.

.....

(2)

The size of the angle in the triangle at  $C$  is  $90^\circ$ .

- (c) Write down the mathematical name for this type of angle.

.....

(1)

(Total 5 marks)

14.

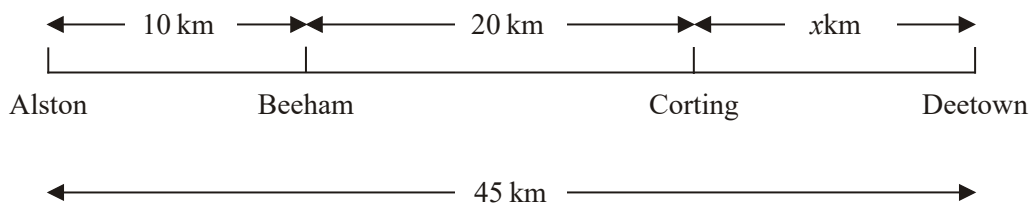


Diagram **NOT**  
accurately drawn

The diagram represents a straight road that joins 4 towns.

Beeham is 10 km from Alston.  
 Corting is 20 km from Beeham.  
 Deetown is  $x$  km from Corting.  
 Deetown is 45 km from Alston.

- (a) Work out the distance from Alston to Corting.

..... km (1)

- (b) Work out the value of  $x$ .

$x =$  ..... (1)

Emma walks from Alston to Corting.  
 Josh walks from Beeham to Deetown.

- (c) Who walks further?

.....

You must explain your answer.

.....  
 .....

(2)

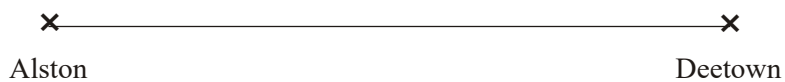
Kyle walks from Alston to Beeham.  
 He starts from Alston at 9:30  
 He takes one hour 30 minutes to get to Beeham.

- (d) At what time does Kyle get to Beeham?

.....

(1)

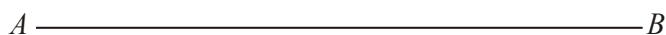
The diagram below shows the straight road from Alston to Deetown.  
 This diagram has been drawn accurately using a scale of 1 cm to represent 5 km.



- (e) Mark accurately with crosses (×), the positions of Beeham and Corting.

(1)  
 (Total 6 marks)

15. (a) Measure the length of the line  $AB$ .  
 Give your answer in centimetres.



..... cm

(1)

- (b) Mark the midpoint of the line  $AB$  with a cross (×).

(1)



- (c) In the space below, draw accurately a circle of radius 4 cm.  
Use the point  $C$  as the centre of your circle.

$\times$   $C$

(1)  
(Total 3 marks)

16. Here is a point  $P$  marked with a cross ( $\times$ ).

$P \times$

- (a) Draw a line 7 cm long.  
Start from the point  $P$ .
- (b) On your line, mark with a cross ( $\times$ ) the point which is 3 cm from  $P$ .  
Label this point  $Q$ .

(1)  
(Total 2 marks)

17.

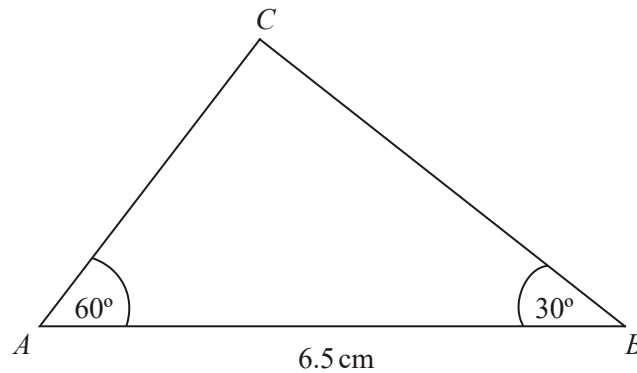


Diagram **NOT** accurately drawn

- (a) Make an accurate drawing of triangle  $ABC$ .  
The side  $AB$  has already been drawn for you.



(2)

- (b) Measure the size of the angle at  $C$  in your triangle.

.....°

(1)

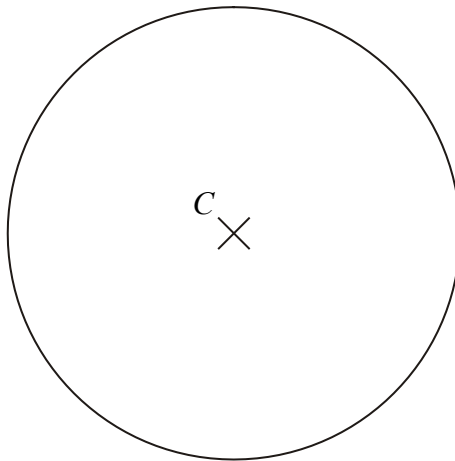
(Total 3 marks)

18. (a) The point  $O$  has been marked with a cross ( $\times$ ).  
Draw a circle with radius 4 cm and centre  $O$ .



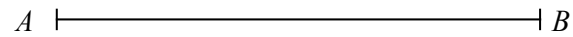
(1)

- (b) Here is a circle centre  $C$ .  
Draw a diameter in the circle.



(1)  
(Total 2 marks)

19. (a) Measure, in centimetres, the length of the line  $AB$ .



..... cm

(1)

- (b) Mark the midpoint of the line  $AB$  with a cross (X).

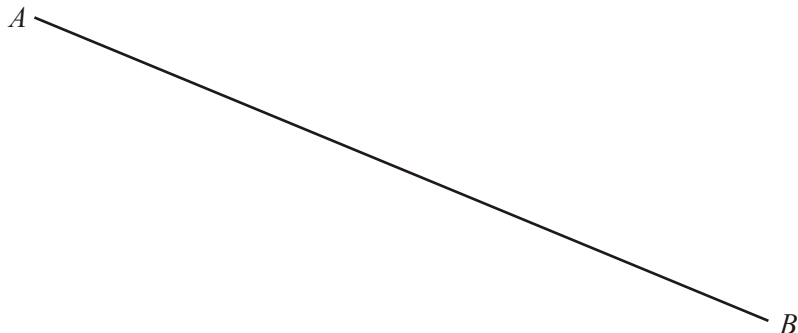
(1)

(Total 2 marks)

20. Draw accurately a circle of radius 4 cm.

(Total 1 mark)

21.



(a) Measure the length, in centimetres, of  $AB$ .

.....cm

(1)

(b) Find, and mark with a cross ( $\times$ ), the midpoint of the line  $AB$ .

(1)

(Total 2 marks)

22. In the space below, use ruler and compasses to **construct** an equilateral triangle with sides of length 4 centimetres.  
You must show all construction lines.

(Total 2 marks)

23. Here is a sketch of a rhombus.

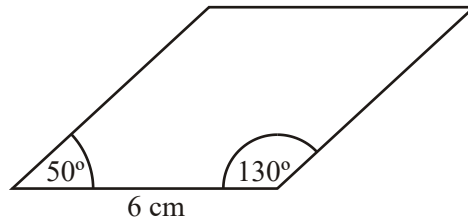


Diagram **NOT** accurately drawn

The rhombus has a side of length 6 cm.  
One angle of the rhombus is  $50^\circ$ .  
Another angle of the rhombus is  $130^\circ$ .

Use a ruler and a protractor to make an accurate drawing of the rhombus.

(Total 3 marks)

24. The diagram shows a sketch of a triangle.

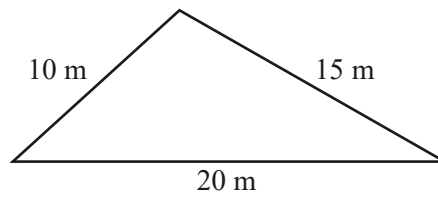
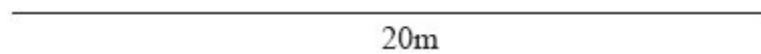


Diagram **NOT** accurately drawn

The lengths of the sides of the triangle are 20 m, 10 m and 15 m.

Use a scale of 1 cm to 2 m to make an accurate scale drawing of the triangle.  
The 20m line has been accurately drawn.



(Total 3 marks)

25. The diagram shows a sketch of triangle ABC.

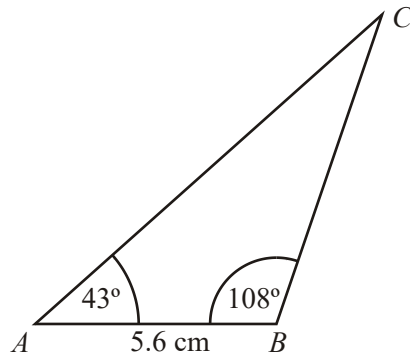
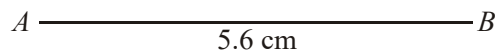


Diagram **NOT** accurately drawn

$AB = 5.6$  cm.  
Angle  $A = 43^\circ$ .  
Angle  $B = 108^\circ$ .

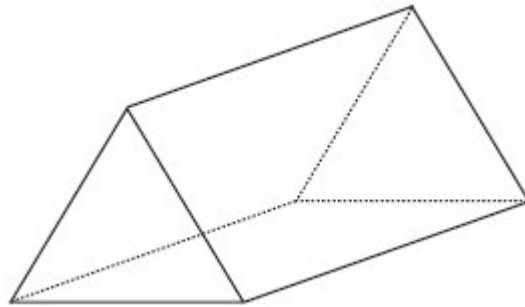
Make an accurate drawing of triangle  $ABC$ .  
The line  $AB$  has been accurately drawn.



(Total 3 marks)



26.



The diagram shows a triangular prism.  
The cross-section of the prism is an equilateral triangle.

- (a) In the space below, draw a sketch of a net for the triangular prism

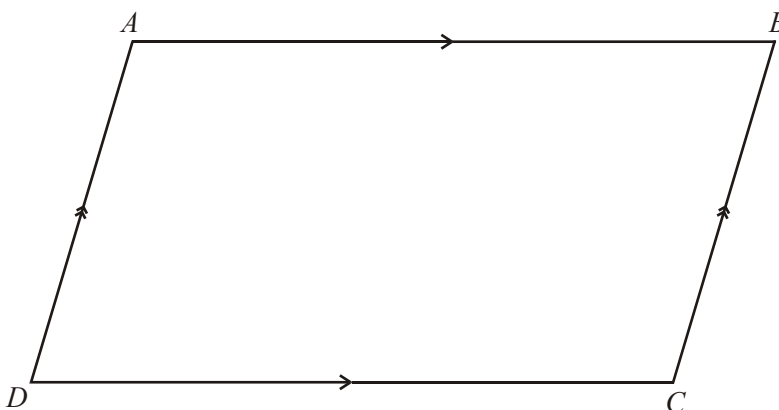
(2)

- (b) In the space below, use ruler and compasses to **construct** an equilateral triangle with sides of length 6 centimetres.  
 You must show all construction lines.  
 One side of the triangle has already been drawn for you.



(2)  
 (Total 4 marks)

27. Here is an accurate drawing of a quadrilateral **ABCD**.



- (a) Write down the special name for this quadrilateral.

.....

(1)

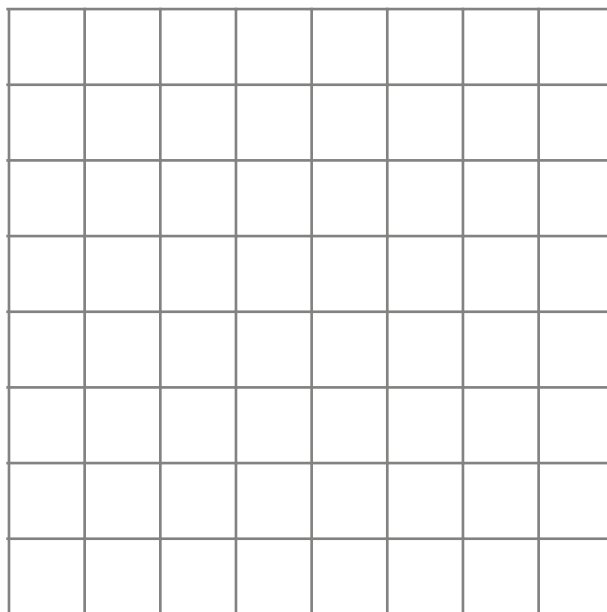


(b) Measure the length  $PQ$ .

.....cm

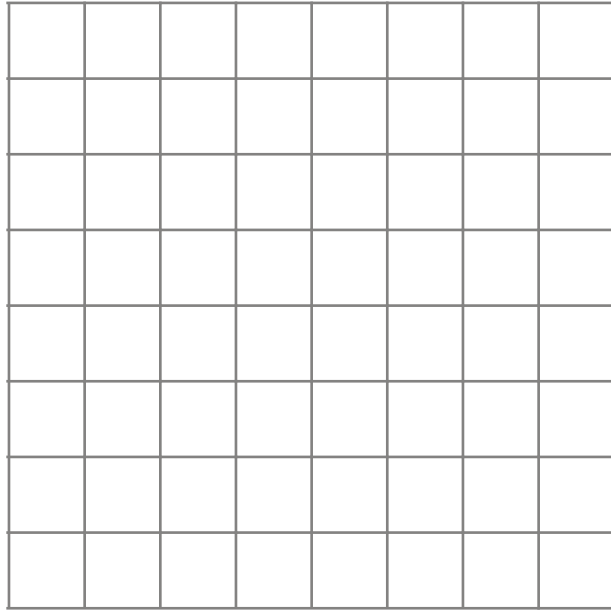
(1)  
(Total 2 marks)

28. (a) On the grid below, draw a right-angled triangle.



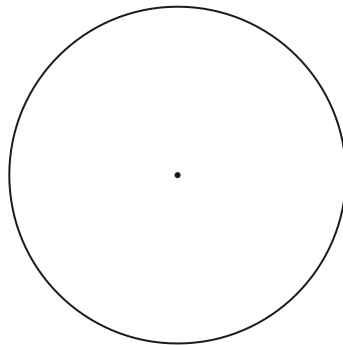
(1)

- (b) On the grid below, draw an isosceles triangle.



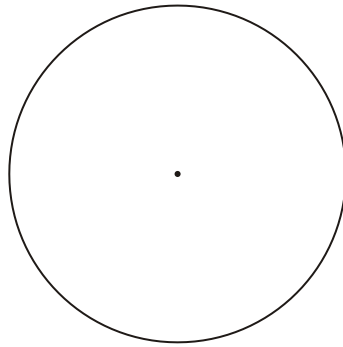
(1)  
(Total 2 marks)

29. (a) In the circle below, draw a diameter.



(1)

- (b) In the circle below, draw a sector.  
Shade your sector.



(1)  
(Total 2 marks)

30. The diagram shows a sketch of triangle  $ABC$ .

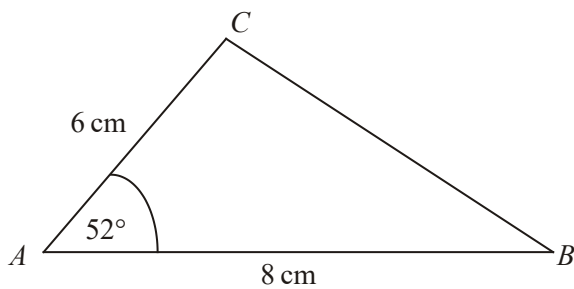


Diagram **NOT** accurately drawn

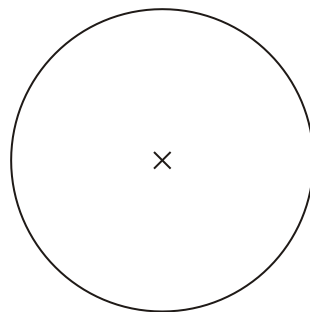
$AB = 8$  cm.  
 $AC = 6$  cm.  
 Angle  $A = 52^\circ$ .

In the space below, make an accurate drawing of triangle  $ABC$ .  
 The line  $AB$  has been drawn for you.



(Total 2 marks)

31. In the circle, draw a diameter.



(Total 1 mark)

- |    |              |   |   |
|----|--------------|---|---|
| 1. | (a) line     | <i>BI within overlay tolerance</i>                                    | 1 |
|    | (b) midpoint | <i>BI within overlay tolerance ft from (a) <math>\pm 0.2</math>cm</i> | 1 |

	(c) rectangle		1	
		<i>B1 for rectangle 6 cm <math>\pm 0.2</math>cm by 4 cm <math>\pm 0.2</math>cm</i>		
				<b>[3]</b>
2.	(a) 6cm		2	
		<i>B1 for 6 <math>\pm 0.2</math> or 60 <math>\pm 2</math></i>		
		<i>B1 indep for cm or mm consistent with 1<sup>st</sup> B1</i>		
	(b) At centre		1	
		<i>B1 within overlay</i>		
	(c) Circle drawn		1	
		<i>B1 all within overlay</i>		
				<b>[4]</b>
3.	(a) 60		1	
		<i>B1 cao</i>		
	(b) 120		2	
		<i>360 – 60 – 90 – 90</i>		
		<i>M1 for 360 – “60” – 90 – 90 or 180 – “60”</i>		
		<i>A1 cao</i>		
	(c) 12		2	
		<i>6 <math>\times</math> 2</i>		
		<i>M1 for 6 <math>\times</math> 2</i>		
		<i>A1 cao 12</i>		
	(d) Correct drawing		2	
		<i>B2 for triangle and construction lines</i>		
		<i>(B1 for 1 line of length 4cm and correct arcs crossing</i>		
		<i>OR for correct triangle with either no arcs or incorrect arcs)</i>		
		<i>SC: B1 similar triangle drawn with construction lines</i>		
				<b>[7]</b>

4. 3  
*B3 for correct triangle and arcs*  
*(B2 for correct triangle with no/incorrect arcs OR*  
*for 2 correct sides and arcs)*  
*(B1 for 2 correct sides)*  
**[3]**
5. (a) Draws perp. 1  
*B1 for correctly drawing perp must touch line or cut line*  
*AB  $\pm$  2mm*
- (b) Sketches a cylinder 1  
*B1 for sketching cylinder*  
**[2]**
6. (a) Accurate drawing of triangle 2  
*B1 cao for  $38^\circ (\pm 2^\circ)$*   
*B1 cao (indep) for BC drawn 7.3 cm ( $\pm 2$ mm) and completing*  
*the triangle.*
- (b)  $63^\circ$  1  
 Measure angle A  
*B1 for  $63^\circ (\pm 2^\circ)$  or ft their diagram ( $\pm 2^\circ$ )*  
**[3]**
7. (a) Line 6 cm long 1  
*B1 for line 6 cm  $\pm$  0.2cm*
- (b) Point 2 cm from A 1  
*B1 for point 2 cm  $\pm$  0.2cm from A*  
**[2]**



8. Angle  $A = 90^\circ \pm 2^\circ$   
 Angle  $B = 120^\circ \pm 2^\circ$   
 $AD = 5\text{cm} \pm 0.2\text{ cm}$   
 $BC = 4\text{cm} \pm 0.2\text{ cm}$   
 Construction 4
- B4 for fully correct quadrilateral  
 (B3 for 3 measurements correct  
 B2 for 2 measurements correct  
 B1 for 1 measurement correct)*
- [4]
9. (a) Diameter drawn 1  
*B1 for a diameter*
- (b) Right angle marked 1  
*B1 R marked correctly*
- (c) Rectangle drawn 1  
*B1 for a rectangle*
- [3]
10. Cuboid drawn 2  
*B2 for correct isometric drawing in any orientation (ignore points 'behind', mark 7 vertices only); accept lines drawn near to dots as long as there is no ambiguity.  
 (B1 for one of the three faces drawn correctly or for an isometric drawing of any cuboid)*
- [2]
11. (a) 1  
*B1 for any line parallel to L*
- (b) 1  
*B1 for any line perpendicular to P*
- [2]

12. (a) Correct line  
*Bl cao (tol  $\pm 2mm$ )* 1
- (b) Correct point  
*Bl (tol  $\pm 2mm$ )* 1
- (c) Correct circle  
*Bl (tol  $\pm 2mm$ )* 1
- [3]**
13. (a) Correct drawing  
*B2*  
*(Bl for either angle A correct or for angle B correct  $\pm 2$ )* 2
- (b) 5.6 cm or 56 mm  
*Bl ft on triangle (tol  $\pm 2 mm$ )*  
*Bl cm or mm (consistent)* 2
- (c) right angle  
*Bl cao* 1
- [5]**
14. (a) 30  
*Bl cao* 1
- (b)  $45 - (10 + 20)$   
 $= 15$   
*Bl ft on  $45 - '30'$*  1
- (c) Distance AC is 30  
Distance BD is 35  
 $= \text{Josh}$   
*Bl for 'Josh'*  
*Bl for correct reasoning* 2
- (d) 11.00  
*Bl cao* 1
- (e) Correct diagram  
*Bl (tol  $\pm 2mm$ )* 1
- [6]**

15. (a) 7 1  
*B1 for  $7 \pm 2\text{mm}$*
- (b) 1  
*B1 for correct position  $\pm 2\text{mm}$*
- (c) 1  
*B1 for all parts within  $\pm 2\text{mm}$ , use overlay* **[3]**
- 
16. (a) Correct line 1  
*B1 For a single line of length in the range 6.8cm to 7.2cm drawn with or without using the given point P*
- (b) Correct point 1  
*B1 for point Q identified on their line within the range 2.8 cm to 3.2 cm from P* **[2]**
- 
17. (a) Diagram (overlay) 2  
*B2 within guidelines of the overlay*  
*(B1 for exactly one given angle correctly drawn within guidelines of overlay)*
- (b) 90 1  
*B1 for an angle in range 86 to 94*  
*or ft 'angle' measured correctly within  $\pm 2^\circ$*  **[3]**
- 
18. (a) circle drawn 1  
*B1 for a circle drawn within guidelines (see overlay)*
- (b) diameter drawn 1  
*B1 for line through C and touching circle at both ends* **[2]**

19.	(a)	6.4	1	
		<i>B1 for 6.2 – 6.6 inclusive; accept 62-66 with mm stated.</i>		
	(b)	Midpoint marked	1	
		<i>B1 for midpoint marked at 3 – 3.4 inclusive</i>		[2]
20.		Circle	1	
		<i>B1 circle within overlay (radius 4cm <math>\pm</math> 2mm)</i>		[1]
21.	(a)	10..3 to 10.7	1	
		<i>B1</i>		
	(b)	See overlay	1	
		<i>B1</i>		[2]
22.		Correct construction	2	
		<i>B2 for triangle and construction lines (see overlay)</i>		
		<i>(B1 for 1 line of length 4cm and correct arcs crossing</i>		
		<i>OR for a correct triangle with either no arcs or incorrect arcs)</i>		
		<i>SC: B1 for similar triangle drawn <b>with</b> construction lines</i>		[2]
23.		construction	3	
		<i>B3 for fully correct rhombus within overlay</i>		
		<i>(B2 for a line of 6cm and angles of 50° and 130° within overlay</i>		
		<i>B1 for a line of 6cm and one correct angle or angles of 50° and 130° within overlay)</i>		[3]
24.		correct triangle	3	
		<i>B3 for triangle within the overlay</i>		
		<i>(B1 for 10m line ending within arcs on the overlay</i>		
		<i>B1 for 15m line ending within arcs on the overlay)</i>		
		<i>S.C. B2 for 2 arcs within the overlay and triangle not drawn</i>		[3]

25. within overlay 3  
*B3 for a fully correct triangle within overlay*  
*[B2 for  $108^\circ$  and  $43^\circ \pm 2^\circ$  drawn at either A or B]*  
*[B1 for either  $108^\circ$  or  $43^\circ \pm 2^\circ$  drawn at either A or B]* [3]
26. (a) Correct net 2  
*B2 cao*  
*(B1 for 2 equilateral triangles joined appropriately to at least one rectangle or for 1 equilateral triangle joined appropriately to one of the three rectangles)*
- (b) Correct drawing 2  
*B1 for two extra sides of length 6 cm ( $\pm 2\text{mm}$ )*  
*B1 for construction arcs 6cm from each of the ends of the given line* [4]
27. (a) Parallelogram 1  
*B1*
- (b) 7.5 1  
*B1 for answer in the range 7.3 to 7.7 inclusive* [2]
28. (a) Diagram of a right-angled triangle 1  
*B1 for any triangle drawn containing a right-angle*
- (b) Diagram of an isosceles triangle 1  
*B1 for any triangle drawn with two sides of equal length* [2]
29. (a) diameter 1  
*B1 for a diameter drawn*
- (b) Sector 1  
*B1 for sector drawn (ignore shading)* [2]

30. Correct triangle 2  
*B2 for correct triangle in guidelines*  
*(B1 for angle of  $52^\circ (\pm 2^\circ)$  or side  $AC = 6\text{cm} (\pm 2\text{ mm})$ )*

[2]

31. Diameter drawn 1  
*B1 for a diameter drawn*

[1]

1. The majority of candidates were able to draw a line 12cm long, mark its midpoint, and draw a rectangle with the specified dimensions.

## 2. Mathematics A Paper 2

This question was well understood by most candidates and candidates scored well on this easily accessible question. It is still a great shame that candidates lost marks because they did not have the necessary equipment for the examination and so found it difficult to draw a circle and find the midpoint and length of the line.

## Mathematics B Paper 15

Providing the candidate had the correct equipment, i.e. a pair of compasses, ruler and pencil which would fit the compasses, then this proved to be a straightforward starter question. Most candidates measured the line using metric units although there were a few candidates who used imperial units. Most indicated the units being used for the length of the line. Sadly many candidates did not use the correct equipment for drawing a circle which led to inaccuracy.

3. Many candidates gave the correct answer of  $60^\circ$  in part (a) although answers of  $45^\circ$  and  $120^\circ$  were not uncommon. In part (b) the angle marked  $y$  was usually calculated by using the sum of angles at a point or by dividing the sum of the angles of a hexagon by 6. However, many candidates used  $360^\circ$  as the angle sum of a hexagon. The majority of candidates appreciated that six triangles were needed in part (c) and attempted to evaluate  $6 \times 2\text{cm}^2$  but it was disappointing that a significant number of them then calculated  $6 \times 2^2$ , leading to an answer of 24.

4. This question was generally answered well with the majority of candidates gaining at least one mark. It was pleasing that many candidates used a pair of compasses and drew the appropriate arcs. There were a significant number of candidates, however, who did not use compasses and some of these candidates attempted to add arcs.

5. Candidates did not understand the idea of perpendicular and most candidates joined point  $C$  to  $A$  and or  $B$ . A few candidates confused parallel and perpendicular and drew a line through  $C$  parallel to  $AB$ . Only 7% of candidates drew the perpendicular correctly whilst 77 % of candidates were able to draw cylinder correctly in part (b).
6. Many drawings were made to within the permitted tolerance, although some candidates apparently had no protractor and, occasionally, no ruler either. Some candidates did not draw their triangle on the given base but this was not penalised. Part (b) was often correct but it was not unusual to see either an obtuse angle given as the answer or an angle of  $75^\circ$ , probably obtained by reading clockwise from 70 on the protractor.
7. This question proved to be a good starter question, with well over 85% of the candidates scoring both marks. Some candidates did not recognise that the  $\times$  below  $A$  was where the line should start, drawing their line from the letter  $A$ . They were, however, not penalised for this.
8. it was pleasing to note that almost all candidates were able to score at least 1 or 2 marks by constructing at least 1 or 2 of the given lines and angles accurately, with nearly 40% of the candidates scoring all 4 marks. Where most candidates fell down was in the accurate construction of the  $120^\circ$  angle.
9. This question was well understood but candidates often drew a radius in part (a). They were more successful with parts (b) and (c) being able to recognise a right angle and draw a rectangle. It was a pity that more candidates did not have a ruler as the rectangles were often drawn freehand. They were not penalised for this in this question.
10. Those candidates able to use the isometric grid correctly usually drew a cuboid with the correct dimensions and gained full marks. The majority of candidates, however, appeared to have no idea how to use the isometric grid properly and their drawings nearly always included horizontal lines, which are incorrect when drawing on such a grid. Many candidates did still gain 1 mark for drawing the right hand face correctly.
11. Candidates understood this question but often reversed their attempts at perpendicular and parallel.

12. Parts (a) and (b) were successfully completed by the great majority of candidates though there was a significant minority whose midpoint fell outside the tolerance allowed in part (b). The mark available for correctly drawing a circle of diameter 6cm was awarded to only about one quarter of the candidates. Often there was no attempt at this part of the question and where an attempt was made, many candidates lacked the skill to use a pair of compasses with accuracy. The circle was drawn with an incorrect diameter in many cases.
13. Part (a) of this question, requiring an accurate drawing, was poorly answered. It may be that many candidates did not have access to a protractor as they did not attempt this part. Of those who did, many merely tried to redraw the diagram given. A good proportion of candidates were able to salvage some marks from parts (b) and (c) for appropriate units and for correctly naming the right angle. However, it appears that some candidates had not read the question carefully and tried to classify the angle "C" in their diagram as acute or obtuse rather than respond to the statement that angle "C" was  $90^\circ$ .
14. Most candidates scored well on this question, with the first four parts being answered successfully by a majority of candidates. Some candidates gave the answer "10" to part (b), maybe because in the diagram, the line segment between Corting and Deetown is about the same length as the line segment between Alston and Beeham. Part (e) on use of scale and accurate measurement proved to be more of a challenge to most candidates. Only a small proportion were able to place both Beeham and Corting accurately on the diagram.
15. This question was also well answered. Only 1% of candidates failed to score any marks. Nearly all candidates appeared to have access to a ruler and a pair of compasses and most used them with reasonable accuracy. Freehand attempts at drawing the circle were rarely seen. A small minority of candidates drew a circle with diameter 4cm rather than with a radius 4cm.
16. All but a few candidates were able to demonstrate their ability to draw a 7 cm line accurately. However this was often not drawn from the given point. Candidates did not lose the mark for this provided their intended 7 cm line was unambiguous. Following their success in part (a), the vast majority were then able to place the point  $Q$ , 3 cm from  $P$ , again not always following the directions of the question and often merely placing a letter  $Q$  on their line.
- Those whose measurements were incorrect were often 1 cm short, indicating they had started from 1 instead of 0 on their ruler. There was still some evidence of candidates not having a ruler.



**17. Specification A**

Accurate use of a protractor was seen to be poor with very many candidates unable to draw angles of 60 and 30 degrees.

A correct angle at A was often followed by candidates just joining B to the point given by the protractor, giving an incorrect value of 70° for C. In part (b), many gained a mark from either knowing that 90° was the required angle or by accurately measuring their angle at C.

**Specification B**

Part (a) was not done well. The majority of candidates were able to score 1 mark for drawing an angle of 60° at A, but many had difficulty in drawing the 30° angle at B. Candidates should be advised that diagrams are given for guidance and, in general, are not accurately drawn. In part (b), it was evident that relatively few candidates measured the size of their angle at C. Many simply wrote down the answer completely independently of their diagram (or lack of diagram) in part (a). For a significant number of candidates a common incorrect answer was to draw an equilateral triangle in part (a) and then to write down 90° in part (b).

- 18.** In part (a) it was obvious that many candidates did not have a compass, and therefore wasted this mark. Those who did have a compass usually presented an accurate circle. In part (b) it was surprising the number of candidates who failed to draw a diameter. A common error was predictably the drawing of a radius, but many drew the diameter as a chord, perhaps through the letter C rather than the centre X, or left the question blank.

**19. Specification A**

This was a well answered question. The only common errors was not placing the ruler correctly on A, measuring the distance between the letters A & B rather than the line AB, and placing the midpoint inaccurately “by eye” rather than by measuring.

**Specification B**

Nearly 80% of the candidates were able to measure the length of the line with a high degree of accuracy as well as mark the mid-point within acceptable tolerances. The most common error was to merge the two parts of the question and give the distance to the mid-point.

Others wrote down 3.2 in (a), not realising that the length of the whole line was required.

- 20.** The success of this question was effected by lack of equipment, whilst other candidates confused diameter and radius. A minority of candidates drew shapes other than circles.

21. The line was measured accurately in most cases. Quite a few candidates started measuring the line from 1 cm thereby recording the answer as 11.5 cm. Most were able to draw the midpoint within the accepted tolerances.
22. There were many accurate constructions offered which gained full marks. Those gaining only one mark usually failed to show construction arcs and merely drew the required triangle instead of constructing it; this was sometimes accompanied by bogus arcs. A number of candidates chose to construct angles of  $60^\circ$ , this was perfectly acceptable, however a few constructed a perpendicular bisector of the base line and then measured the position of the vertex. This only gained one mark if the triangle was within the tolerances permitted.

### 23. Paper 8

Most candidates attempted to draw a quadrilateral of some description and were able to earn one mark by getting either two angles or one angle and one line within the accepted tolerances. Over 40% of the candidates were able to score 2 or more marks on this question. It was disappointing to note how many freehand lines were drawn even when the question specifically stated that a ruler and a protractor were to be used. The most common error was not making all the lines of length 6cm. Candidates clearly need more practice in providing accurate constructions.

### Paper 9

Only a few (18%) failed to score at least 1 mark, and most scored 2 (42%) or 3 (31%). The accurate drawing of a line of length 6 cm and a correct angle, usually meant that a second angle was automatically correct (by drawing a parallel line) thus gaining 2 marks. Failure to gain the final mark was often a result of completing a parallelogram and not a rhombus (with equal sides).

24. Hardly any candidates used a pair of compasses to accurately construct the triangle. As a result many were able to draw one side accurately but were unable to complete the whole triangle accurately to score all three available marks. A significant number of candidates did not use a ruler making an accurate construction impossible. Most candidates were able to use the given scale correctly.
25. The majority of candidates gained at least one mark, for accurately drawing one of the two required angles. Only just over 50% however completed the full triangle; the obtuse angle of  $108^\circ$ , generally being the angle drawn incorrectly, angles of  $112^\circ$ ,  $92^\circ$  and  $72^\circ$  being the usual errors.

26. Most candidates earned at least one mark in part (a) for their sketch of a net of the given triangular prism. Failure to score full marks was usually a result of sketches of; one rectangle with an equilateral triangle at each end, an equilateral triangle on each side, parallelograms (instead of rectangles) and trapezia instead of rectangles for the sides. Some candidates drew flaps onto their sketches; these were ignored and did not account for any loss of marks. A significant number of candidates, clearly understanding what a net is, tried to draw in perspective view.  
A greater number of candidates scored full marks in part (b) by clearly showing accurate construction arcs; however the absence of these arcs still is the most common source of error.
27. It was disappointing to find that even when any recognizable form of 'parallelogram' was given the mark, only a third of the candidates were able to score a mark in part (a). There was a great deal more success with measuring the line although quite a few candidates put 75, not fully understanding the difference between mm and cm.
28. In part (a), only a few candidates failed to draw/sketch an acceptable example of a right-angled triangle. Many of these merely drew a right-angle; again a result of careless reading of the question. In part (b), success was not as high. Many attempts to draw an isosceles triangle failed due to inaccurate measuring or poor demonstration of the symmetric properties of an isosceles triangle.
29. Another well-understood question with most candidates gaining both marks though many radii were seen for (a) and segments for part (b). Candidates were expected to draw diameters within 2mm of the circumference for part (a) and semicircles were awarded the mark in (b).
30. Competency in drawing accurate diagrams is a weakness. Despite allowing some tolerance, few candidates gained full marks. Both the length of the line or the angle were frequently drawn inaccurately. Of particular concern is the number of candidates who redrew an exact copy of the diagram in the question.
31. It was disappointing to see that just over a half of the candidates were able to draw a diameter in the circle. As it was not the intention to assess accurate drawing in this question, freehand drawing was usually accepted as long as the intention was clear.  
Unfortunately, many candidates drew a radius or more than one radius and some drew a radius and a diameter. This could not be accepted unless the diameter was labelled. Some candidates attempted to draw a freehand circle inside the given circle given whilst other candidates did not attempt the question at all.