Q1.　　The diagram shows a sketch of triangle ABC.
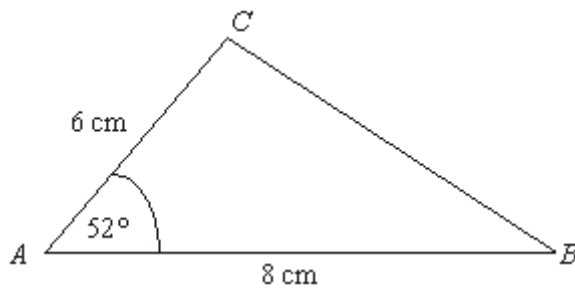

Diagram **NOT** accurately drawn
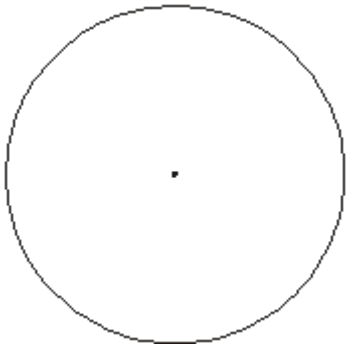
AB = 8 cm.
AC = 6 cm.
Angle A = 52°.

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

A _____ B

(Total 2 marks)
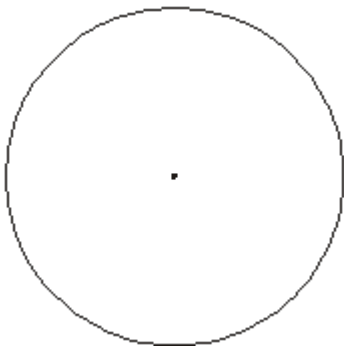
Q2.　　(a)　　In the circle below, draw a diameter.

(1)

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

(1)
(Total 2 marks)

Q3.   In the circle, draw a diameter.
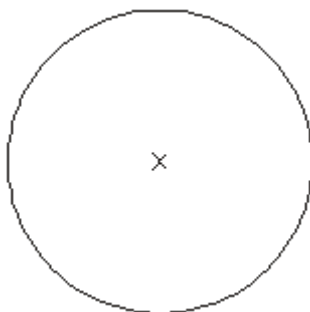
(Total 1 mark)

Q4.   Tom wants to clean the upstairs windows of his house.

He decides to buy a ladder.

The ladder has to reach exactly 3.8 metres up the wall of the house.

To be safe, the ladder has to be at an angle of 72° to the ground.

What length of ladder should Tom buy?

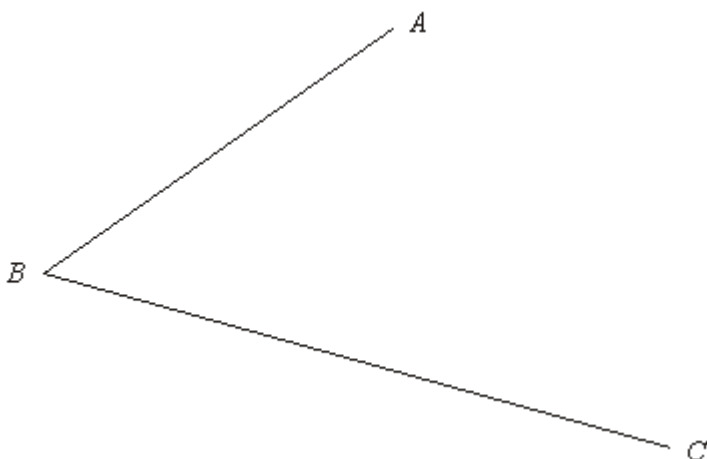**Q5.**   In the space below, use ruler and compasses to **construct** an equilateral triangle with sides of length 6 centimetres.
You must show all your construction lines.

One side of the triangle has already been drawn for you.

(Total 2 marks)

Q6.   Use ruler and compasses to construct the bisector of angle ABC.
You must show all your construction lines.

(Total 2 marks)

Q7.   (a)   Measure the length of the line AB.
Give your answer in centimetres.

A ————————————————————————B

.... cm

(1)

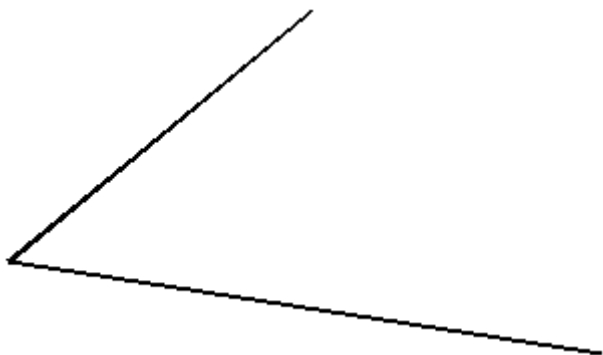(b)   Mark the midpoint of the line AB with a cross (×).

(1)

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

C
×

(1)
(Total 3 marks)

Q8.   Use ruler and compasses to **construct** the bisector of this angle.

You must show all your construction lines.

(Total 2 marks)

Q9.   (a)   Measure, in centimetres, the length of the line AB.

A ├──────────────────────────┤ B

.... cm

(1)
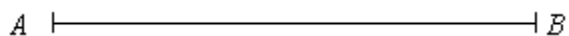
(b)   Mark the midpoint of the line AB with a cross (✖).

(1)
(Total 2 marks)

Q10.   (a)   The point O has been marked with a cross (✖).

Draw a circle with radius 4 cm and centre O.

O
×

(1)

(b)   Here is a circle centre C.

Draw a diameter in the circle.

c
×
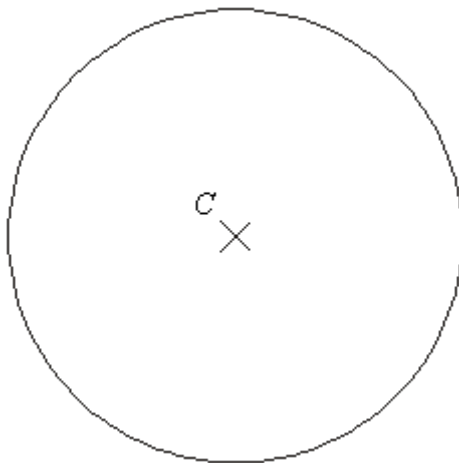
(1)
(Total 2 marks)

Q11.   Here are the plan and front elevation of a solid shape.

Plan

Front Elevation
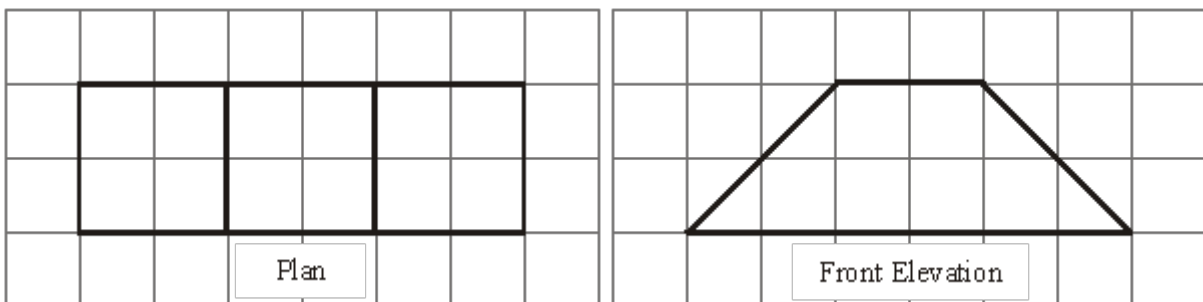
(a)   On the grid below, draw the side elevation of the solid shape.
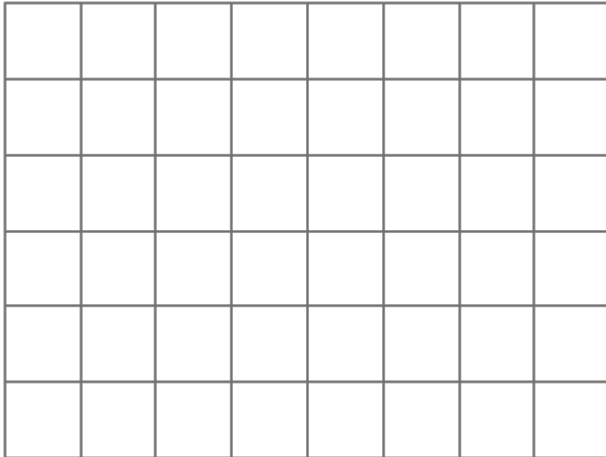
(2)

(b)   In the space below, draw a sketch of the solid shape.

(2)
(Total 4 marks)

Q12.
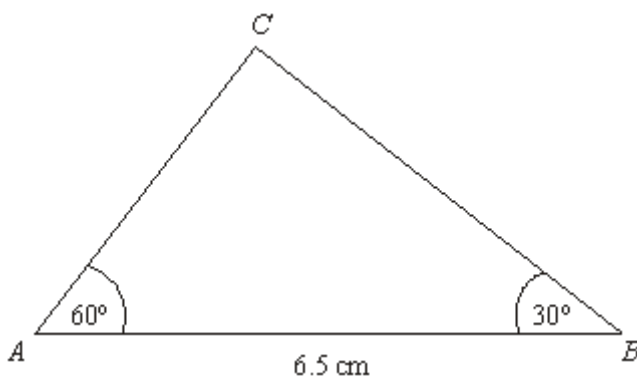
Diagram **NOT** accurately drawn

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

A ————————————————————— B

(2)

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

....°

(1)
(Total 3 marks)

Q13. Here is a point P marked with a cross (✖).

P ✖

(a) Draw a line 7 cm long.
     Start from the point P.

(1)

(b) On your line, mark with a cross (✖) the point which is 3 cm from P.
     Label this point Q.

(1)

(Total 2 marks)

Q14. Here is a sketch of triangle ABC.

Diagram **NOT**
accurately drawn
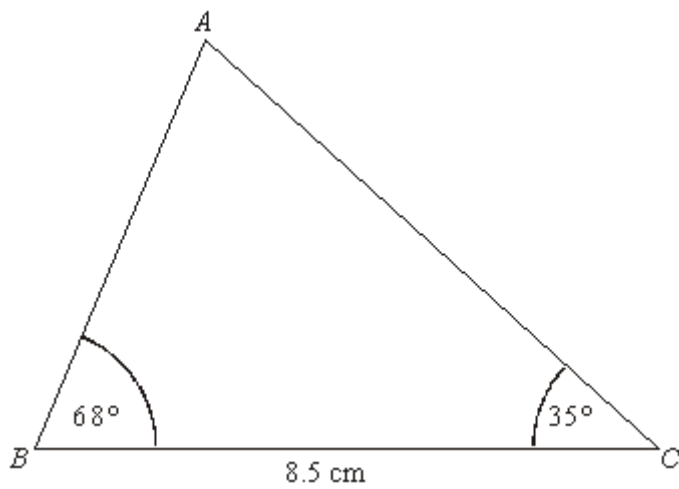
BC = 8.5 cm
Angle B = 68°
Angle C = 35°

Draw an accurate diagram of triangle ABC in the space below.

(Total 3 marks)

M1.

Answer	Mark	Additional Guidance
Correct triangle	2	**B2** for correct triangle in guidelines (**B1** for angle of 52° (±2°) **or** side AC = 6 cm (±2 mm))
		Total for Question: 2 marks

M2.

	Answer	Mark	Additional Guidance
(a)	diameter	1	**B1** for a diameter drawn
(b)	Sector	1	**B1** for sector drawn (ignore shading)
			Total for Question: 2 marks

M3.

Answer	Mark	Additional Guidance
Diameter drawn	1	**B1** for a diameter drawn
		Total for Question: 1 mark

M4.

	Working	Answer	Mark	Additional Guidance
FE		4.0 m ± 0.1 m	4	**M2** for drawing a right angled triangle (M1 for a sketch of a right angled triangle) **M1** for drawing an angle of 72º ± 2º **A1** for answer of 4.0 m ± 0.1 m
				Total for Question: 4 marks

M5.

Answer	Mark	Additional Guidance
Correct construction	2	**M1** for constructing intersecting arcs of equal radius. **A1** for a correct triangle, with appropriate arcs. SC: **B1** for a triangle drawn within guidelines if M0 scored. NB: Guidelines allow for 2mm tolerance
		Total for Question: 2 marks

M6.

Answer	Mark	Additional Guidance
	2	**M1** for correct intersecting arcs **A1** for correct angle bisector SC: if no marks, **B1** for line within guidelines
		Total for Question: 2 marks

M7.

	Answer	Mark	Additional Guidance
(a)	7	1	**B1** for 7 ± 2mm
(b)		1	**B1** for correct position ± 2mm
(c)		1	**B1** for all parts within ± 2mm, use overlay
			Total for Question: 3 marks

M8.

Answer	Mark	Additional Guidance
construction	2	**M1** for a pair of arcs drawn from the same centre on 2 lines at same distance from meeting point; or a single arc crossing both lines; using an arc with a radius which is the length of the shorter line will imply an intersection with the end of that line.

(± 2mm)
A1 for bisector (± 2°) and correct arcs
SC: B1 for bisector (± 2°) with no arcs, or incorrect arcs if **M0** awarded.
Accept bisectors that are dashed or dotted.

Total for Question: 2 marks

M9.

	Answer	Mark	Additional Guidance
(a)	6.4	1	**B1** for 6.2 – 6.6 inclusive; accept 62-66 with mm stated.
(b)	Midpoint marked	1	**B1** for midpoint marked at 3 – 3.4 inclusive
			Total for Question: 2 marks

M10.

	Answer	Mark	Additional Guidance
(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
			Total for Question: 2 marks

M11.

	Answer	Mark	Additional Guidance
(a)		2	**M1** rectangle with either correct width or height or any square **A1** cao
(b)		2	**B2** for a correct sketch (**B1** any 3-D sketch of no more than 4 faces seen, with a trapezoidal face)
			Total for Question: 4 marks

M12.

	Answer	Mark	Additional Guidance
(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 ±2°
			Total for Question: 3 marks

M13.

	Answer	**Mark**	**Additional Guidance**
(a)	Correct line	1	**B1** For a single line of length in the range 6.8 cm to 7.2 cm 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
			Total for Question: 2 marks

M14.

Working	**Answer**	**Mark**	**Additional Guidance**
8.5 cm line drawn angles at B and C drawn	Correct Construction of triangle	3	**B1** 8.5 cm line drawn tolerance ± 0.2cm **B1** angles at B and C drawn tolerance ± 2° **B1** fully correct within tolerance
			Total for Question: 3 marks

E1.   Competency in drawing accurate diagrams is a weakness. Despite allowing some tolerance, few candidates gained full marks. Both the length of the line or he angle were frequently drawn inaccurately. Of particular concern is the number of candidates who redrew an exact copy of the diagram in the question.

E2.   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).

E3.   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.

E5.   Foundation

Most candidates attempted this question and many gained at least one mark for drawing a triangle within the required tolerance. This was often achieved by drawing the perpendicular bisector of the base (by sight rather than construction) and then measuring 6 cm from each end of the base or by measuring 60° angles. Less than half of the triangles within tolerance were drawn using compasses. Those candidates who did use compasses to do a correct construction usually gained both marks.

Higher

This question was generally done with most candidates showing their construction arcs and drawing an accurate triangle. Some constructed a 60° angle at both ends of the line. Candidates should be advised to draw their construction lines clearly. A small but significant number of candidates constructed the perpendicular bisector of the line and apparently used a protractor to complete the triangle. Those candidates not showing construction arcs were still able to score 1 mark for an accurate triangle within tolerance.

E6.   Foundation

Badly done. Only one in ten of candidates were able to draw a bisector. Construction lines were rarely seen. 5% of candidates gained both marks for constructing a bisector with reasonable accuracy. A further 5% gained 1 mark for drawing a bisector without construction lines but within an acceptable tolerance.

Higher

There was little evidence of candidates not having the appropriate equipment to carry out this construction; however correct use of compasses was not seen often enough. Many candidates used the ends of the arms of the angle as centres for their constructed intersecting arcs and thus failed to construct a bisector. Some candidates measured the angle and drew a bisector. If this was within tolerance, one mark was awarded.

E7.   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.

E8.   Specification A

Foundation

Many candidates did not attempt this part, and few earned marks. It was clear that many did not understand the term "bisect". Some drew a line through the angle, but it was hardly a bisector. Some who had a compass started by drawing a pair of arcs, but then could not progress the solution.

Higher

Of the candidates scoring 2 marks, most did this with very neat and precise responses, showing clear construction lines, although a few candidates did use very faint or minimal arcs which were difficult to see. In general it appeared that most candidates knew that bisect meant split the angle in half, although some candidates were seen to construct perpendicular bisectors through the 2 lines and others created a triangle and produced a perpendicular bisector of the new line.

The candidates gaining 1 mark were equally split between those splitting the angle without construction lines and those who drew arcs on the original lines. Many candidates were thrown by the fact that the two arms of the given angle were of different lengths and they drew arcs from the ends of the lines.

Specification B

Most candidates knew what the term 'angle bisector' meant but in many cases could not carry out the required construction. There were some cases where a candidates found the perpendicular bisector of the bottom arm of the angle or where the ends of the arm where joined and the midpoint of that line found to get the candidate's angle bisector.

E9.   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.

E10.   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.

E11.   Specification A

Foundation

The understanding of this topic is mixed. Clearly many candidates are confused with the terminology of side/front elevation and plan in part (a), very many simply copying one of the two elevations shown.

In part (b), attempts at a 3-D sketch were generally good and many candidates scored at least one mark in this part.

Higher

The correct answer of a 2 by 2 square was drawn by about half of the candidates. A very

common error was to draw a rectangle with either the correct width or the correct height. Some candidates reproduced the given plan whilst others reproduced the given front elevation.

Part (b) was answered quite successfully. Most candidates seemed to have a good understanding of what was required and appreciated that the shape should look like a prism. Some of the sketches were not too well drawn but the majority at least showed a trapezoidal face.

Specification B

Foundation

Many candidates were able to score at least 1 mark for this question.

In part (a), few candidates drew a 2 × 2 square for the side elevation of the solid shape, but many were able to score a mark for a drawing an acceptable rectangle. In part (b), Many candidates were able to score at least 1 mark for an acceptable sketch of the solid shape.

Some had difficulty in maintaining the same perspective throughout the whole sketch. Common incorrect answers here include sketches of triangular prisms, cubes, cuboids and nets.

Higher

There were many good answers to part (a) although some candidates thought the required elevation looked like the plan or like the front elevation.

Answers to part (b) were generally successful.

E12.   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).

E13.   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.