General Certificate of Secondary Education
June 2009

MATHEMATICS (SPECIFICATION A)   **4306/2F**
Foundation Tier
Paper 2 Calculator

F

Monday 1 June 2009   9.00 am to 10.30 am

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed: 1 hour 30 minutes

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Answers written in margins or on blank pages will not be marked.
- Do all rough work in this book.

Information
- The maximum mark for this paper is 100.
- The marks for questions are shown in brackets.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.
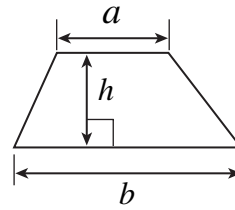
Advice
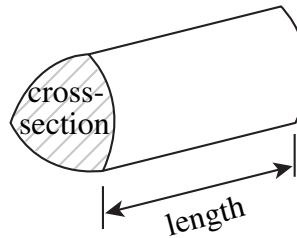- In all calculations, show clearly how you work out your answer.

2

Formulae Sheet: Foundation Tier

Area of trapezium = $\frac{1}{2}(a+b)h$

Volume of prism = area of cross-section × length

Answer **all** questions in the spaces provided.

1 (a) Write in figures the number forty six thousand and nine.

....

Answer .... *(1 mark)*

1 (b) Write in figures a number that is between 2000 and 3000

....

Answer .... *(1 mark)*

1 (c) Write down all of the factors of 10

....

....

....

Answer .... *(2 marks)*

1 (d) (i) Round 6794 to the nearest 10

....

Answer .... *(1 mark)*

1 (d) (ii) Round 6794 to the nearest 100

....

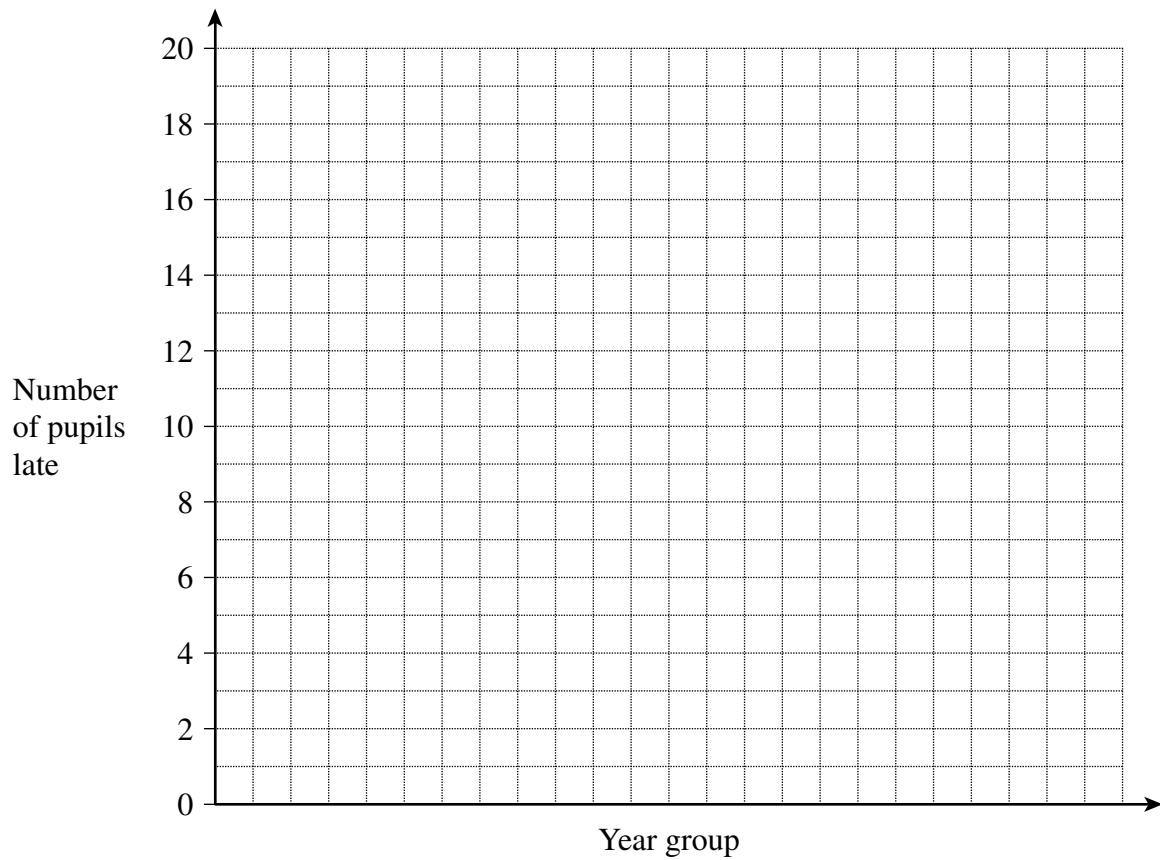Answer .... *(1 mark)*

6

2 The number of pupils in different year groups who are late for school in one week is shown below.

Year group	7	8	9	10	11
Number of pupils late	10	12	15	18	8

Draw a bar chart to show this data.

(3 marks)

*Areas outside
the box will
not be scanned
for marking*

3 *A*, *B*, *C* and *D* are four points on a circle centre *O*.
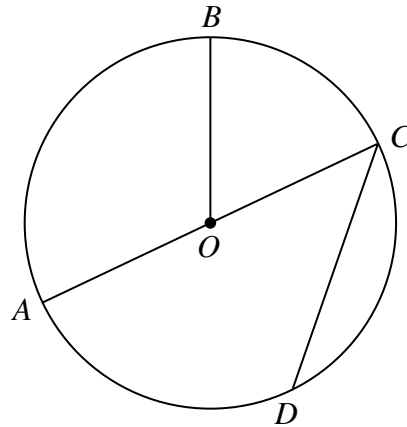
3 (a) Here are five words that are used with circles.

circumference   radius   chord   diameter   sector

Use **one** of these words to complete the following sentences.

3 (a) (i) The straight line *AC* is a .... of the circle.
(1 mark)

3 (a) (ii) The straight line *CD* is a .... of the circle.
(1 mark)

3 (a) (iii) The straight line *OB* is a .... of the circle.
(1 mark)

3 (b) On the diagram below draw the tangent to the circle at point *A*.

(1 mark)

7

Turn over ▶
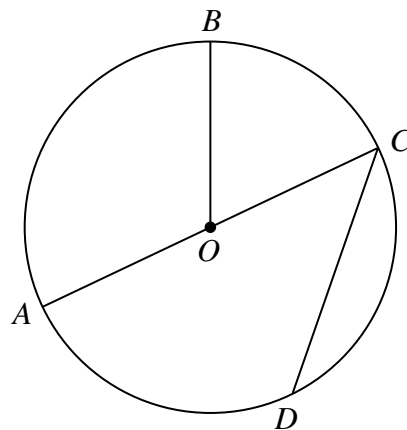
4   Here are six cards with numbers on them.

| 4 | 5 | 6 | 25 | 28 | 50 |

4   (a)   Choose **two** cards that add to give a total of 33

....

....

Answer .... , ...   *(1 mark)*

4   (b)   Choose **three** cards that add to give a total of 35

....

....

Answer .... , ... , ...   *(1 mark)*

4   (c)   Choose **two** cards to complete the statement below.

Write the numbers on the cards.

☐ – ☐   =   19

(1 mark)

4 (d) Choose **two** cards to complete the statement below.

Write the numbers on the cards.

$$\boxed{} \times \boxed{} = 100$$

(1 mark)

4 (e) Choose **two** cards to complete the statement below.

Write the numbers on the cards.

$$\boxed{} \div \boxed{} = 10$$

(1 mark)

Turn over for the next question

Turn over ▶

5

APW/Jun09/4306/2F

5 Here is a sequence of T-shaped patterns.
Each pattern is made from shaded and striped squares.
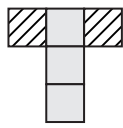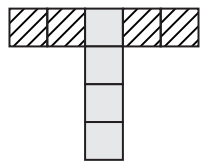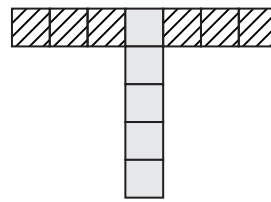
Pattern 1   Pattern 2   Pattern 3

5 (a) Draw Pattern 4.

(2 marks)

5 (b) Complete the table below for Patterns 4 and 5.

	Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5
Number of shaded squares	3	4	5		
Number of striped squares	2	4	6		
Total number of squares	5	8	11		

(2 marks)

5 (c) What is the total number of squares needed for Pattern 10?

....

....

Answer .... *(2 marks)*

6 A triangle and a hexagon are made from identical equilateral triangles.
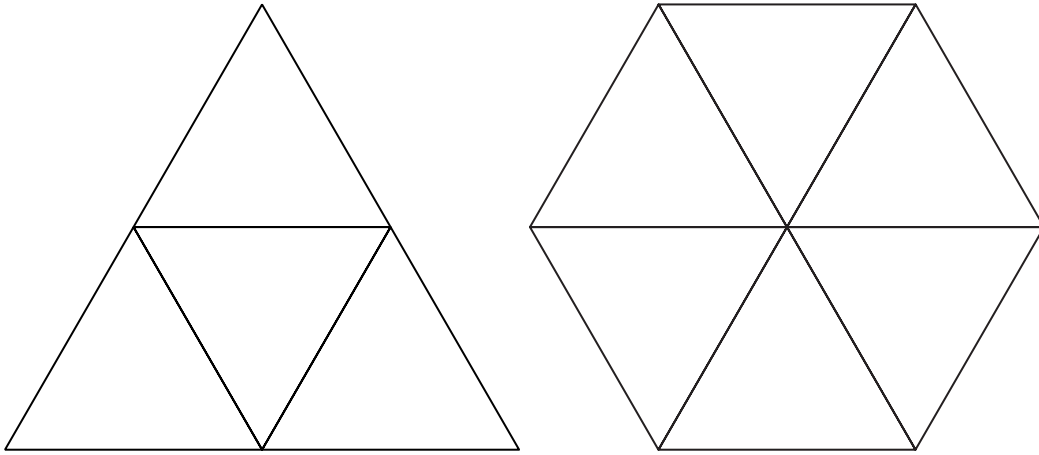
6 (a) Do the triangle and hexagon have the same perimeter?

Tick the correct box.　　Yes ☐　　No ☐

Explain your answer.

....

....
(1 mark)

6 (b) Do the triangle and hexagon have the same area?

Tick the correct box.　　Yes ☐　　No ☐

Explain your answer.

....

....
(1 mark)

8

Turn over ▶

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for marking*

7 Each diagram shows a fair five-sided spinner.

Write a number in each section to make the statement true.

7 (a) Statement: It is certain that you will get the number two.
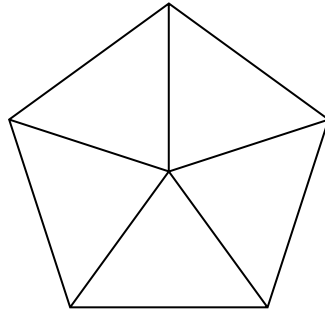
(1 mark)

7 (b) Statement: It is impossible that you will get an even number.
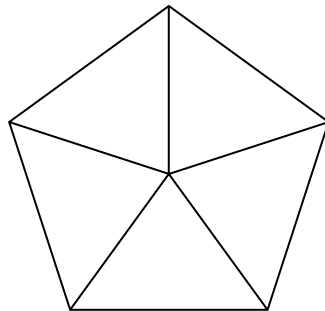
(1 mark)

7 (c) Statement: The probability of getting a 3 is $\frac{2}{5}$
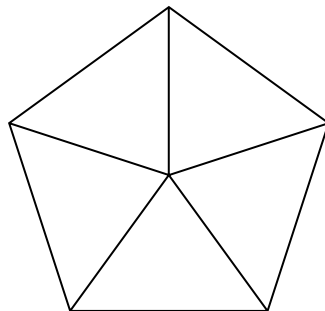
(1 mark)

8   Omar earns £16 200 per year.
He is given a pay rise of 3%.

How much is his pay rise?

....

....

....

Answer £ ....   *(2 marks)*

9   Part of a shopping bill is shown.

0.6 kg of bananas at 75 p per kg	£0.45
…… kg of apples at 90 p per kg	
Total	£1.89

How many kg of apples are bought?

....

....

....

Answer .... kg   *(3 marks)*

Turn over ▶

8

10 (a) Look at this scale.
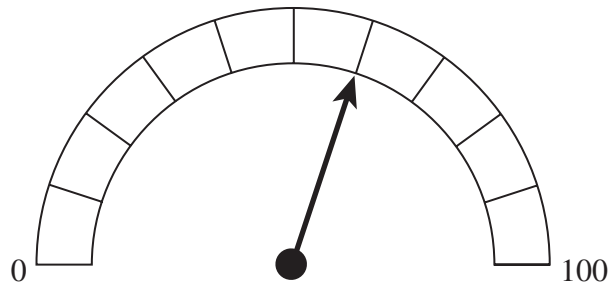
Write down the value shown by the arrow.

....

Answer .... *(1 mark)*

10 (b) Here is a different scale.

Draw an arrow on this scale so that it shows the same value as the arrow in part (a).

0   100

(1 mark)

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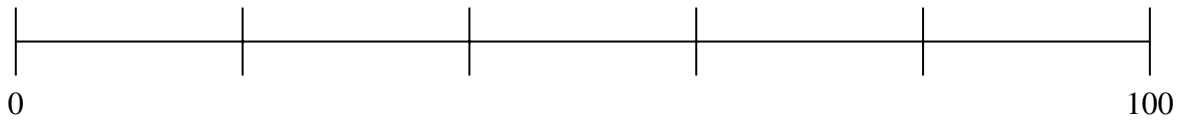
11 (a) Solve $7x = 28$

....

....

Answer $x =$ .... *(1 mark)*

11 (b) You are given that $6y = 48$

Work out the value of $5y$.

....

....

Answer .... *(2 marks)*

11 (c) Find the value of $3x + 5y$ when $x = 7$ and $y = -4$

....

....

Answer .... *(2 marks)*

Turn over for the next question

7

Turn over ▶

12 (a)   Three angles are drawn at a point.

Not drawn accurately

105°   65°

190°
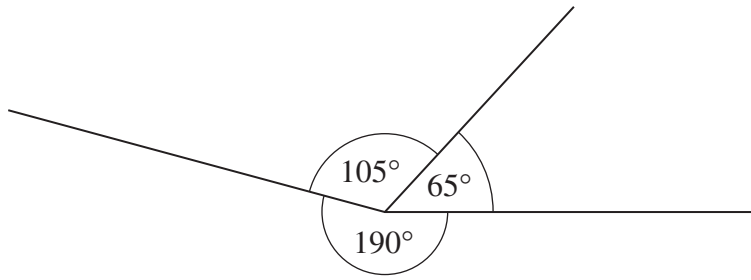
12 (a)   (i)   Write down the size of the acute angle.

Answer .... degrees   *(1 mark)*

12 (a)   (ii)   Write down the size of the obtuse angle.

Answer .... degrees   *(1 mark)*

12 (b)   Explain why this diagram cannot be drawn using these three angles.

140°

130°
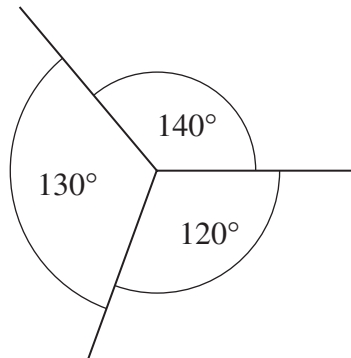
120°   Not drawn accurately

....

....
(1 mark)

12 (c) In the diagram below, *AOB* is a straight line.
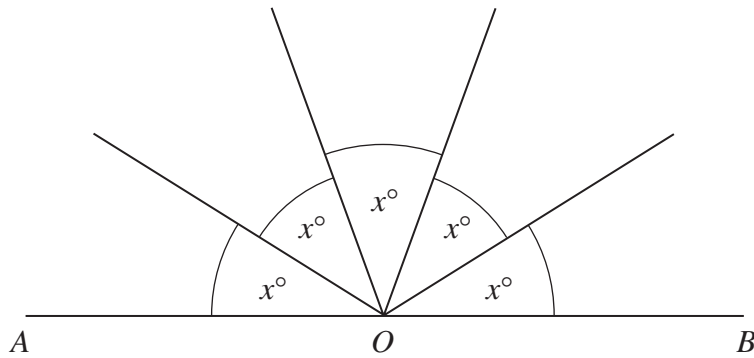
Not drawn accurately

The five angles marked *x* are equal.

Work out the value of *x*.

....

....

Answer .... degrees   *(2 marks)*

12 (d) *ABC* is a right-angled triangle.
Angle *ACB* is 43°
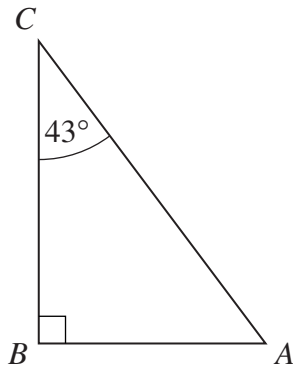
Not drawn accurately

Work out the size of angle *CAB*.

....

....

Answer .... degrees   *(2 marks)*

7

Turn over ▶

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13 (a) Write down the next two terms in the sequence.

31,   27,   23,   19,

....

....

Answer .... , ...   *(2 marks)*

13 (b) What is the rule for continuing the sequence?

....

Answer ....   *(1 mark)*

13 (c) Jane says that the sequence will eventually include –3

Explain why Jane is wrong.

....

....

(1 mark)

14 (a) A bag contains 50 balls which are all the same size.
The balls are numbered 1 to 50
A ball is chosen at random.

14 (a) (i) What is the probability that the ball is numbered 47?

....

....

Answer .... *(1 mark)*

14 (a) (ii) What is the probability that the ball has a number greater than 40 on it?

....

....

Answer .... *(2 marks)*

14 (b) Another bag contains 50 balls which are all the same size.
20 are blue, 10 are red, 10 are yellow and 10 are green.
A ball is chosen at random.

14 (b) (i) What is the probability that the ball is blue?

....

....

Answer .... *(2 marks)*

14 (b) (ii) What is the probability that the ball is **not** blue?

....

....

Answer .... *(1 mark)*

10

Turn over ▶

18

*Areas outside
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15 (a) (i) Calculate 7.2^2

....

Answer .... *(1 mark)*

15 (a) (ii) Calculate $\sqrt{7.2}$

....

Answer .... *(1 mark)*

15 (a) (iii) Calculate 7.2^3

....

Answer .... *(1 mark)*

15 (a) (iv) Calculate the cube root of 7.2

....

Answer .... *(1 mark)*

15 (b) Calculate the reciprocal of 0.2

....

Answer .... *(1 mark)*

16 Paul is making a fence in his garden.
Each panel of the fence needs a post at each end.
For example, here is a four-panel fence made with five posts.
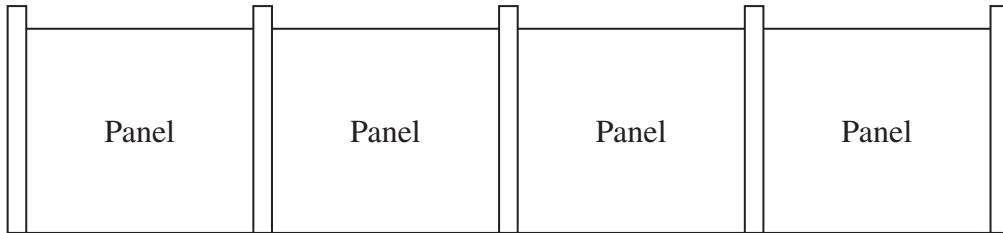
Each post costs £3.20
Each panel costs £14.80

16 (a) How much does a four-panel fence cost?

....

....

....

Answer £ .... *(3 marks)*

16 (b) Another fence costs a total of £111.20

How many panels are there in this fence?

....

....

....

....

Answer .... *(3 marks)*

11

Turn over ▶

17 A sheet of paper measures 40 cm by 20 cm.

Not drawn accurately

20 cm

← 40 cm →
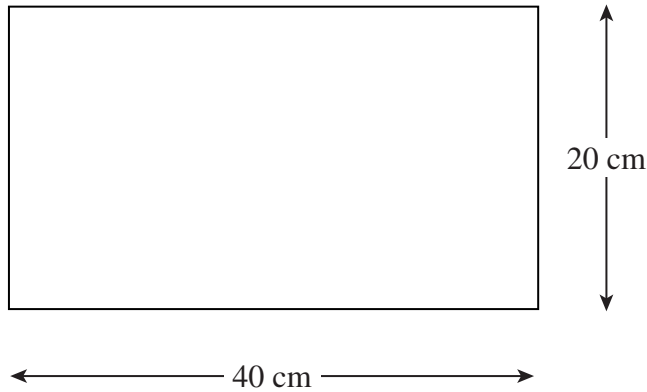
Suki folds the sheet of paper in half to make a new rectangle.
She keeps folding the paper until she has a square measuring 10 cm by 10 cm.

How many times does she fold the paper?

....

....

....

Answer .... *(2 marks)*

18 (a) Use your calculator to work out 5^6

....

Answer .... *(1 mark)*

18 (b) Explain why the units digit of any positive integer power of 5 will always be 5

....

....

....
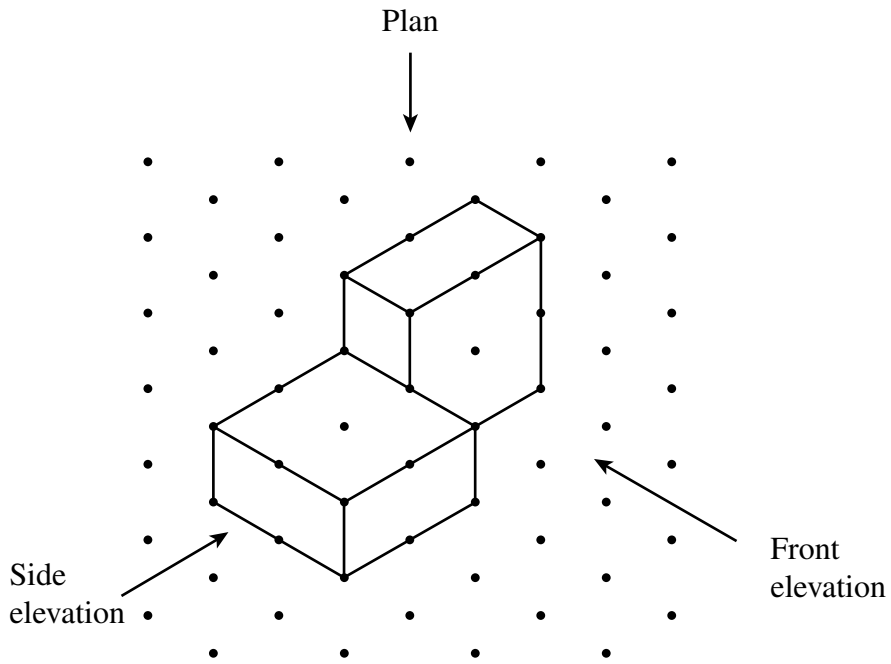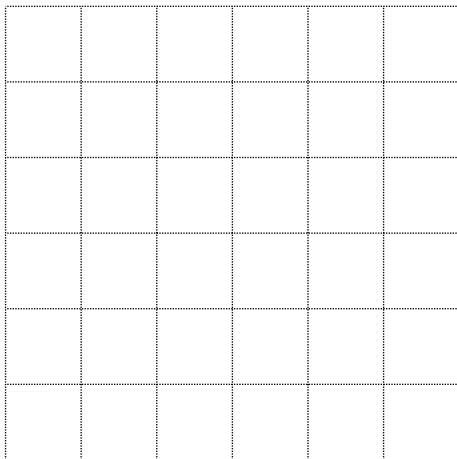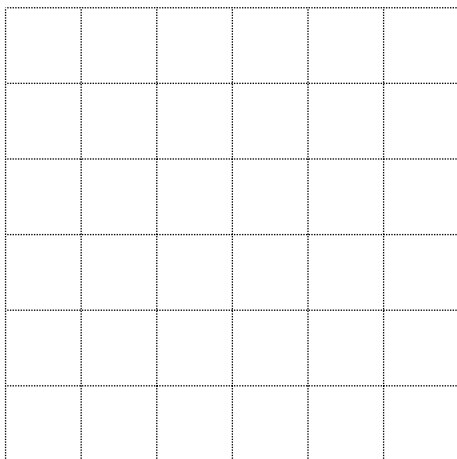
(2 marks)

19

Plan

The diagram shows a solid made from 2 cuboids.
Each cuboid is 1 cm by 2 cm by 2 cm.
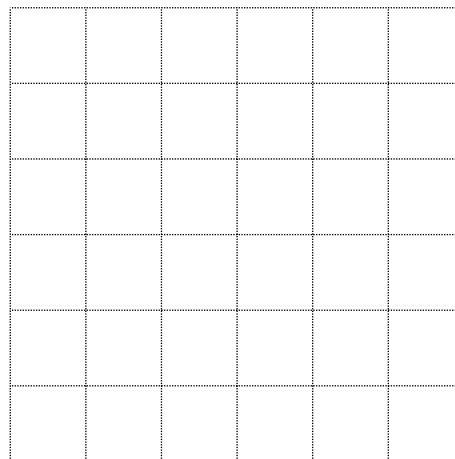Draw the plan, side elevation and front elevation of the solid on the grids below.

Side elevation

Front elevation

Plan

Side elevation

Front elevation

(3 marks)

8

Turn over ▶

20 Shapes are made from quarter circles and rectangles.
For example
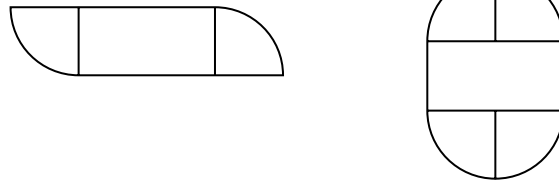
The area of a quarter circle is Q cm^2.
The area of a rectangle is R cm^2.

This shape has an area of $2Q + R$ cm^2.

20 (a) Write down the area of this shape in terms of Q and R.
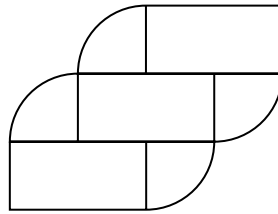
Answer .... cm^2 *(1 mark)*

20 (b) This shape has an area of $R - Q$ cm^2.

Write down the area of this shape in terms of Q and R.
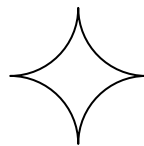
Answer .... cm^2 *(2 marks)*

21 Use your calculator to work out

$$\frac{1.27 + 3.89}{4.87 - 2.15}$$

21 (a) Write down all the figures in your calculator display.

Answer .... *(1 mark)*

21 (b) Round your answer to one decimal place.

Answer .... *(1 mark)*

22 Solve the equations

22 (a) $7x - 9 = 3x + 5$

....

....

....

....

Answer $x = $ .... *(3 marks)*

22 (b) $7(y - 9) = 3y + 5$

....

....

....

....

Answer $y = $ .... *(3 marks)*

11

Turn over ▶

23 The ages of the 15 members of an art class are shown below.

    22   33   45   56   67
    58   19   46   27   35
    22   68   53   42   29

Complete an ordered stem-and-leaf diagram to represent the data.
Remember to complete the key.

....

....

....

....

....

....

```
1 |
2 |
3 |
4 |
5 |
6 |
```
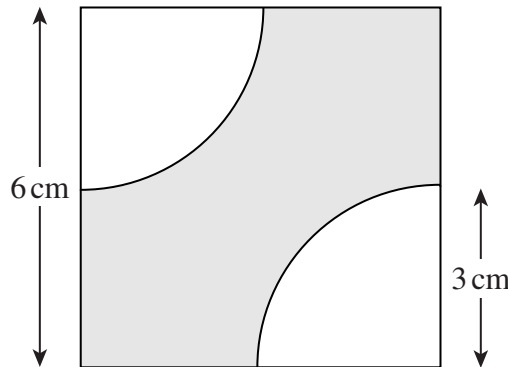
Key … | … represents …

(3 marks)

24 The diagram shows a square and two quarter circles.
The square has sides of 6 cm.
The radius of each circle is 3 cm.

Not drawn
accurately

24 (a) Find the area of the shaded region.

....

....

....

....

....

Answer .... cm^2 *(3 marks)*

24 (b) Jane says that because a square has four lines of symmetry, the shaded area also has
four lines of symmetry.

Is Jane correct?
Give a reason for your answer.

....

....

(1 mark)

7

Turn over ▶

25 In a sale the price of a computer is reduced from £500 to £379

What is the percentage decrease?

....

....

....

Answer .... %   *(3 marks)*

26 Here is some information about class 7J.

There are 30 pupils altogether.
There are 2 more girls than boys.
A quarter of the girls are left-handed.
There are 7 left-handed pupils altogether.

Use this information to complete the two-way table below.

	Boys	Girls	Total
Left-handed			
Right-handed			
Total			30

(2 marks)

END OF QUESTIONS

5

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