Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION

J512/02

MATHEMATICS SYLLABUS A

Paper 2 (Foundation Tier)

FRIDAY 15 JANUARY 2010: Morning
DURATION: 2 hours

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the Question Paper

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

Electronic calculator
Geometrical instruments
Tracing paper (optional)

READ INSTRUCTIONS OVERLEAF

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INSTRUCTIONS TO CANDIDATES

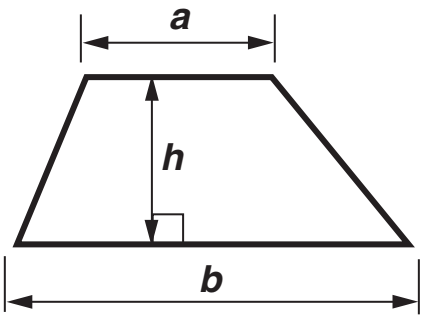
- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **Show your working. Marks may be given for a correct method even if the answer is incorrect.**
- **Answer ALL the questions.**
- **Write your answer to each question in the space provided, however additional paper may be used if necessary.**

INFORMATION FOR CANDIDATES

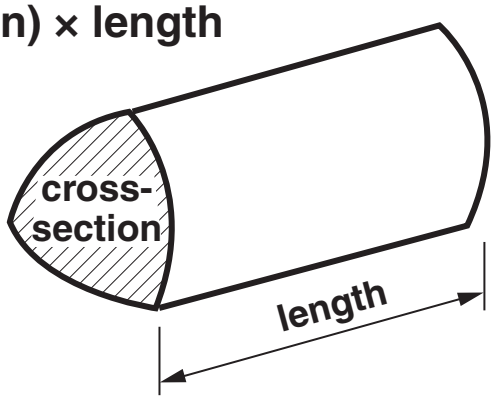
- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **You are expected to use an electronic calculator for this paper.**
- **Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.**
- **The total number of marks for this paper is 100.**

Formulae Sheet: Foundation Tier

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



Volume of prism = (area of cross-section) × length



1 From these numbers in the box below, select the correct one to fill each gap.

5	8	16	4
25	30	36	

(a) _____ is a multiple of 15. [1]

(b) _____ is a factor of 12. [1]

(c) _____ is the square of 5. [1]

(d) The square root of _____ is 4. [1]

(e) _____ multiplied by _____

gives the same answer as 10^2.

_____ [2]

(f) _____ is a prime number. [1]

2 (a) Write these decimals in order of size, smallest first.

0.32 0.201 0.124 0.2

_____

_____

(a) _____ _____ _____ _____ [2]
smallest

(b) A box of cereal costs £2.42.

Work out the maximum number of these boxes that you can buy for £10.

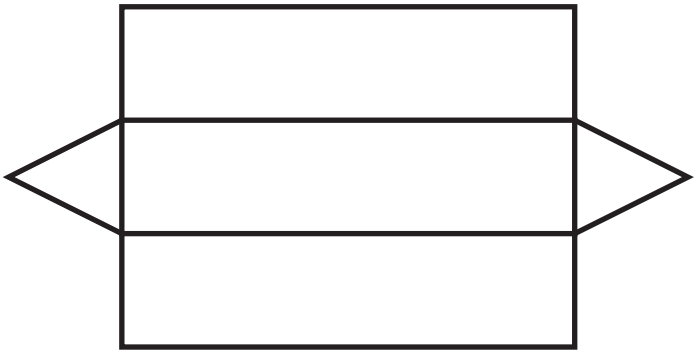
_____

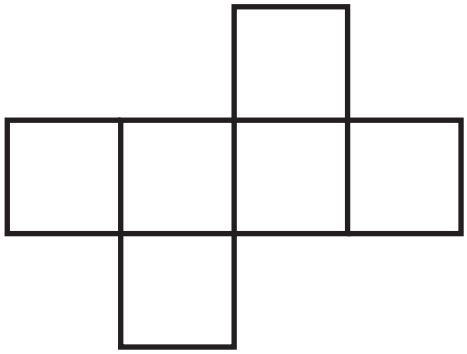
_____

(b) _____ [2]

3 (a) Here are the nets of two 3-D shapes.

Write the name of each 3-D shape below its net.





_____ _____

[2]

(b) Draw a sketch of a square-based pyramid. [2]

(c) Without drawing any diagrams, describe a cylinder.

_____

_____

_____

_____ **[2]**

4 (a) Here is a sequence of patterns.

Pattern 1 **Pattern 2** **Pattern 3** **Pattern 4**

(i) Draw <u>PATTERN 4</u> in the space above. [1]

(ii) Complete this table. [1]

PATTERN NUMBER	1	2	3	4	5
NUMBER OF DOTS	3	5	7		

(b) (i) Write down the next term in this sequence.

3 6 9 12 15 _____ [1]

(ii) Explain in words how you worked out your answer.

_____

_____ **[1]**

(c) (i) Write down the next two terms in this sequence.

72 36 18 _____ _____

_____ **[2]**

(ii) Explain in words how you worked out your answer.

_____

_____ **[1]**

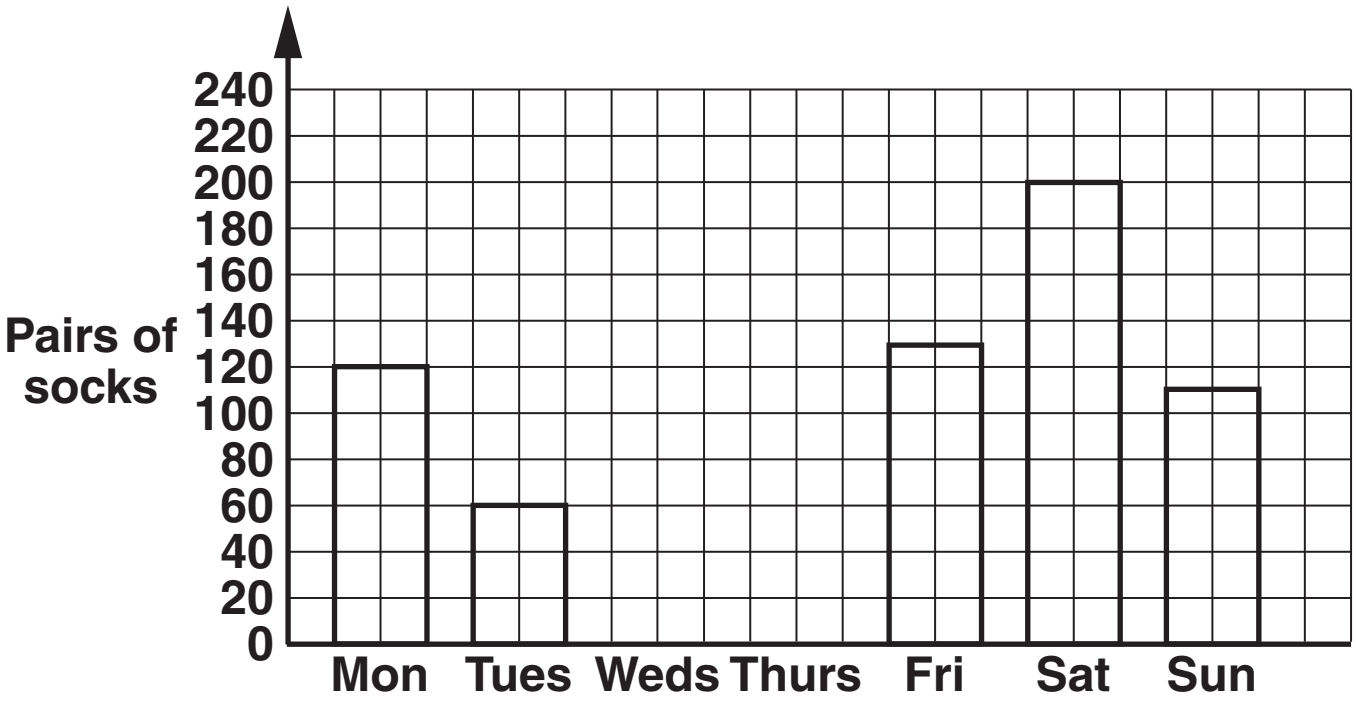
5 Jorgio sells socks.
The pictogram shows last week's sales.

Jorgio's Socks ■ represents 40 pairs of socks		
Monday	■ ■ ■	120
Tuesday	■ ▮	60
Wednesday	■ ■ ▮	
Thursday	■ ▪	
Friday		130
Saturday		200
Sunday	■ ■ ◤	110

(a) In the pictogram, enter the numbers of pairs of socks sold on Wednesday and on Thursday. [2]

(b) Complete the pictogram to show the sales on Friday and on Saturday. [2]

(c) Complete the bar chart to illustrate the information shown in the pictogram.



[2]

6 (a) Write in figures the number 'four million'.

(a) _____ [1]

(b) Write 3538

(i) to the nearest 10,

(b)(i) _____ [1]

(ii) to the nearest 100.

(ii) _____ [1]

(c) Maria buys a bag of sweets costing £1.15 and a sandwich costing £1.08.

Work out how much change she receives from £5.

_____

_____

_____

(c) £ _____ [2]

7 Use your calculator to work these out.

(a) $\sqrt{1.44}$

(a) _____ **[1]**

(b) 17% of 400

_____

_____

(b) _____ **[2]**

(c) 71% of 3.2

_____

_____

(c) _____ **[2]**

8 (a) Tania's class did a French test.
Here are the marks.

MARK	TALLY	FREQUENCY
0		0
1		0
2	I	1
3		0
4	I	1
5	𝍸	5
6	𝍸 I	6
7	I I I	3
8	𝍸 𝍸	10
9	I I I	3
10	I I	2

(i) Write down the mode of these marks.

(a)(i) _____ **[1]**

(ii) How many pupils in Tania's class did the test?

_____

(ii) _____ **[1]**

(b) Some of the class did a maths challenge.
Here are their scores.

12 15 17 21 21 23 23 26 29 35

Work out the mean of these scores.

_____

_____

_____

(b) _____ [3]

9 (a) n represents an even number.

What kind of number is represented by

(i) $n + 1$,

(a)(i) _____ [1]

(ii) $3n$?

(ii) _____ [1]

(b) Work out the value of $3x + 2y$ when $x = 4.2$ and $y = -5$.

_____

_____

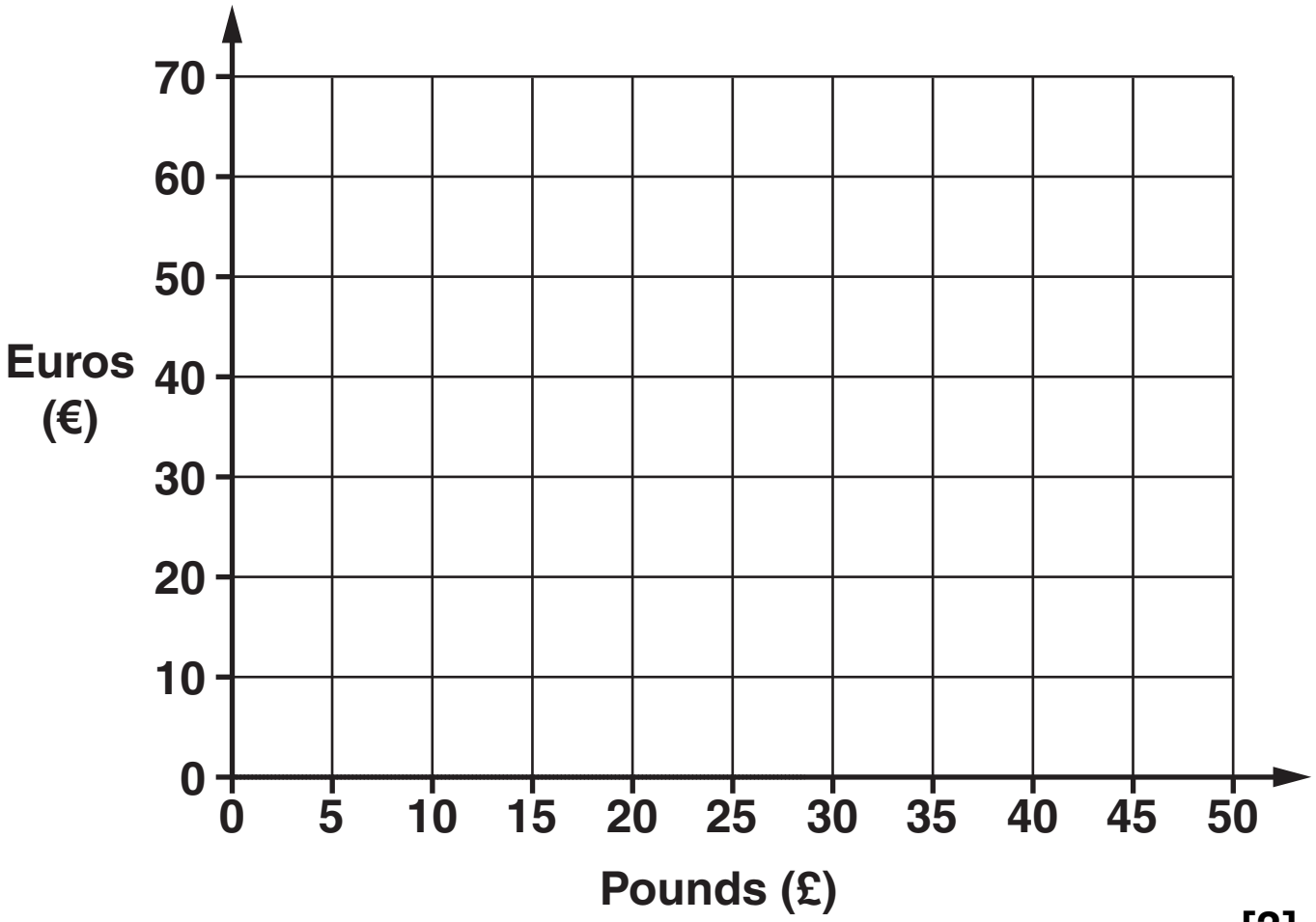
_____

(b) _____ [2]

10 Iqbal wants to change some pounds (£) into euros (€).

He could change £10 for €14
or £20 for €28
or £40 for €56.

(a) Use this information to plot three points on the grid. Join the points with a straight line to form a conversion graph.



[3]

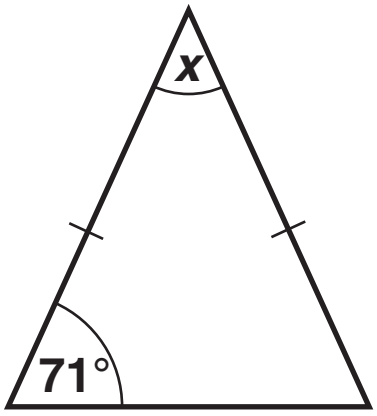
(b) Use your graph to find how many euros Iqbal would get for £32.

(b) €_____ [1]

(c) Use your graph to find how many pounds you would get for €20.

(c) £ _____ [1]

11 (a) Here is an isosceles triangle.



NOT TO SCALE

(i) Work out angle *x*.

_____

_____

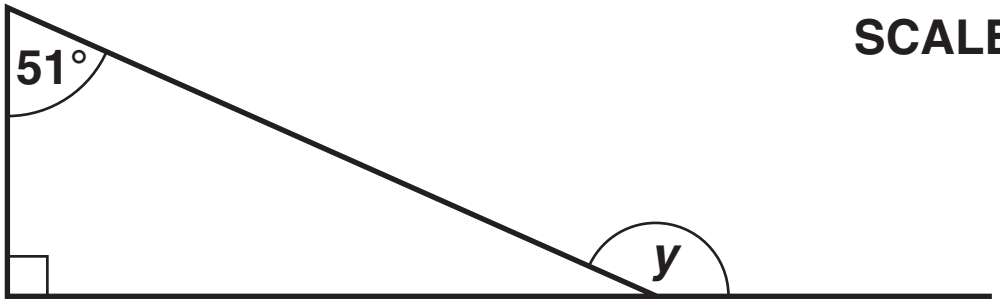
(a)(i) _____° [2]

(ii) Write down an angle fact that you used to work out your answer.

_____

_____ **[1]**

(b) Here is a right-angled triangle.



(i) Work out angle *y*.

_____

_____

_____

(b)(i) _____° [2]

(ii) Write down any angle facts you used to work out your answer.

_____

_____

_____ **[2]**

12 (a) A bag contains red, green and blue discs.
Eleven of the discs are red, five are green and three are blue.
A disc is taken from the bag at random.

Work out the probability that the disc is

(i) red,

_____

_____

(a)(i) _____ [2]

(ii) green or blue,

_____

_____

(ii) _____ [1]

(iii) white.

_____

(iii) _____ [1]

(b) A dice was rolled 200 times.
Here are the results.

Score	1	2	3	4	5	6
Frequency	23	18	26	95	22	16

Explain why these results might make you suspect that the dice is biased.

_____

_____

_____ **[1]**

13 Calculate.

(a) $\dfrac{7.8 - 3.1}{1.2 + 6.9}$

_____

_____

(a) _____ **[2]**

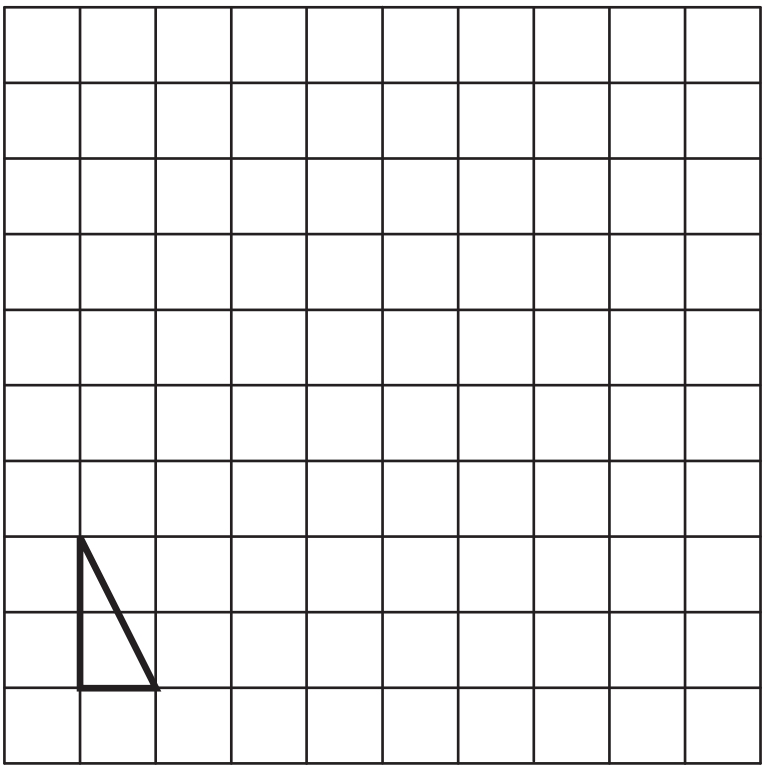
(b) $\sqrt{2.56^2 - 1.4^2}$

_____

_____

(b) _____ **[2]**

14 (a) Draw an enlargement of the triangle.
Use a scale factor of 4.



[2]

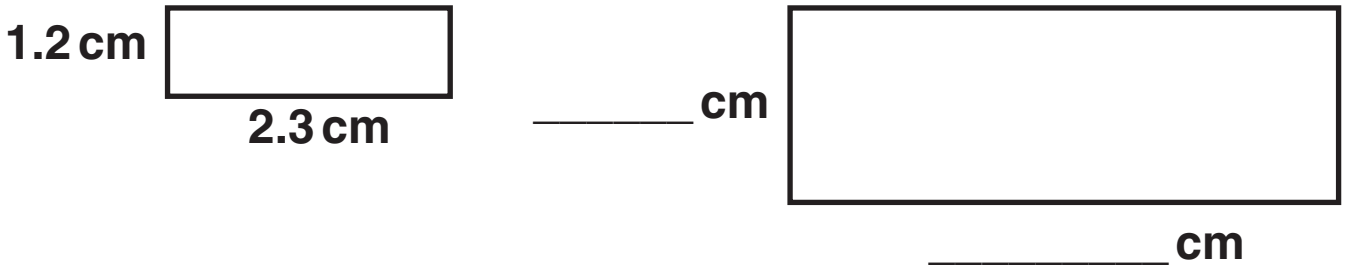
(b) The smaller rectangle has been enlarged by a scale factor of 1.8 to give the larger rectangle.

Work out the length and width of the larger rectangle.

_____

_____

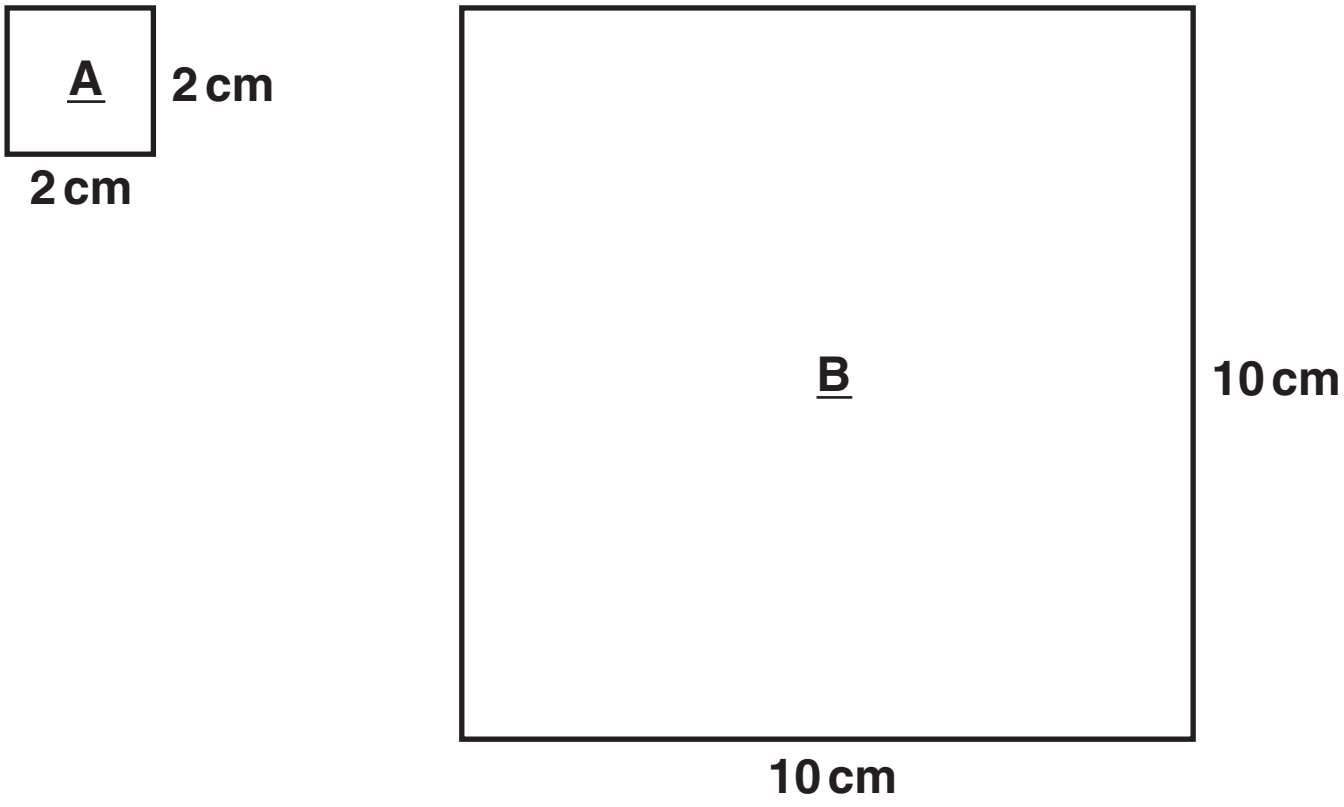
NOT TO SCALE



[2]

(c) Square A has been enlarged by a scale factor of 5 to give square B.

NOT TO SCALE



Complete this sentence.

The area of square B is _____ times the area of square A. **[2]**

15 Jayne uses these ingredients to make play dough.

Play dough for 2 children	
Plain flour	225 g
Oil	2 tablespoons
Water	¾ pint
Salt	140 g

(a) Jayne wants to make enough play dough for 10 children.

Work out the amount of water Jayne will need.

_____

_____

(a) _____ pints [2]

(b) Jayne has lots of oil and water, but only a 1.5 kg bag of plain flour and a 1 kg bag of salt.

What is the maximum number of children Jayne can make play dough for?
You must show your working.

_____

_____

_____

_____

(b) _____ [3]

16 Gary's dogs eat 6 tins of dog food between them each day.
The tins are sold in boxes of 44.
Gary normally buys one box of 44 tins for each week.

Explain, showing your calculations, why Gary does not have to buy a box for the 22nd week.

_____

_____

_____

_____

_____

_____ **[3]**

17 One question on the 2001 Census form was:

'How many cars are available for use by one or more members of your household?'

There was space on the form to write down who lived at that household.
Jenna collects information about the number of people and the number of cars at each household from a sample of 100 Census forms.

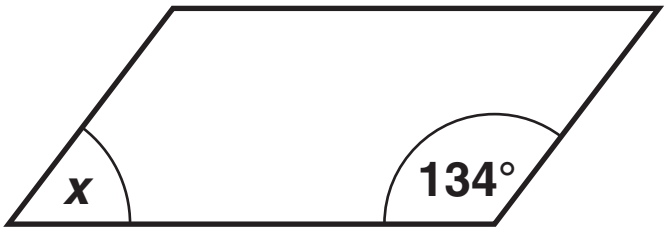
In this sample there were no households where more than 5 people lived and none had more than 3 cars.

(a) Design a two-way table for Jenna to use. [3]

(b) In Jenna's sample there are 14 households with 3 people and 2 cars.

Show this data in your table in part (a). [1]

18 (a) A parallelogram has angles as shown.



NOT TO SCALE

Work out angle *x*.
Give a reason for your answer.

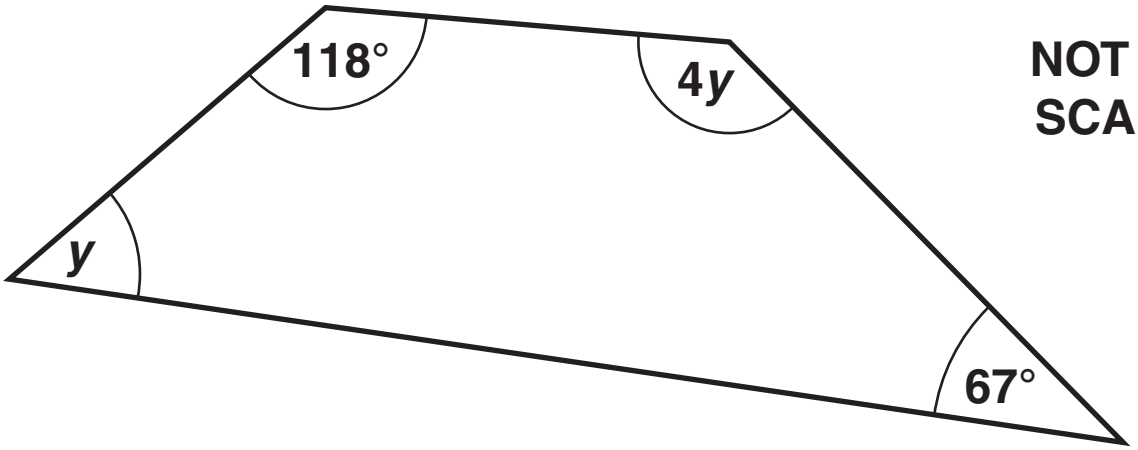
_____

x **= _____° because _____**

_____

_____ **[2]**

(b) A quadrilateral has angles as shown.



NOT TO SCALE

Work out angle *y*.

_____

_____

_____

_____

_____

(b) _____° **[4]**

19 Simplify.

(a) $d^7 \times d^4$

_____

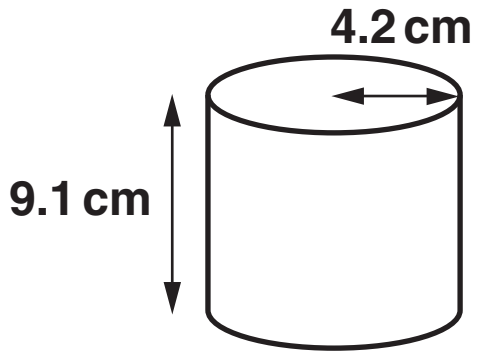
(a) _____ **[1]**

(b) $\frac{d^9}{d^3}$

_____

(b) _____ **[1]**

20 A cylindrical tin has radius 4.2 cm and height 9.1 cm.



Work out the curved surface area of the tin.
Give your answer to an appropriate degree of accuracy.

_____

_____

_____

_____

_____

_____

_____ **cm^2 [4]**

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