

Thursday 17 January 2013 – Morning

GCSE MATHEMATICS A

A503/01 Unit C (Foundation Tier)

Candidates answer on the Question Paper.

OCR supplied materials:

None

Other materials required:

- Scientific or graphical calculator
- Geometrical instruments
- Tracing paper (optional)

Duration: 1 hour 30 minutes



Candidate forename		Candidate surname	
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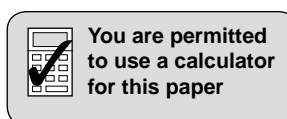
Centre number							Candidate number				
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INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Your answers should be supported with appropriate working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- 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**.
- This document consists of **20** pages. Any blank pages are indicated.

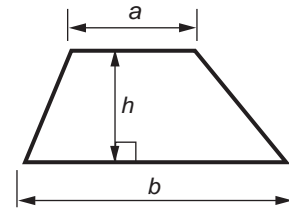


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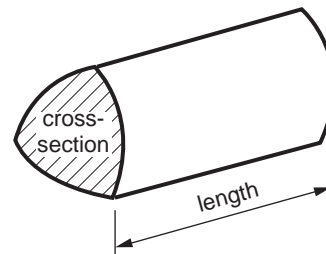
2

Formulae Sheet: Foundation Tier

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



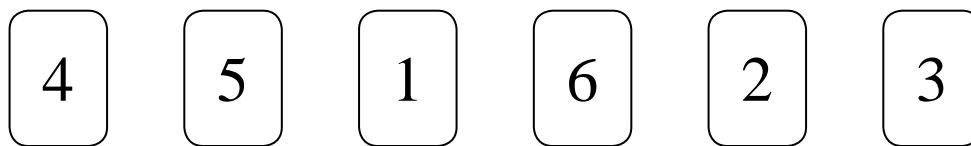
Volume of prism = (area of cross-section) \times length



PLEASE DO NOT WRITE ON THIS PAGE

3

- 1 Caroline chooses one of these cards at random.



Choose a word from the box below to complete each sentence.

impossible	certain	unlikely	evens	likely
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- (a) It is _____ that she chooses an odd number. [1]
- (b) It is _____ that she chooses a multiple of 3. [1]
- (c) It is _____ that she chooses the number 8. [1]
- (d) It is _____ that she chooses a positive integer. [1]

4

2 (a) Complete the following.

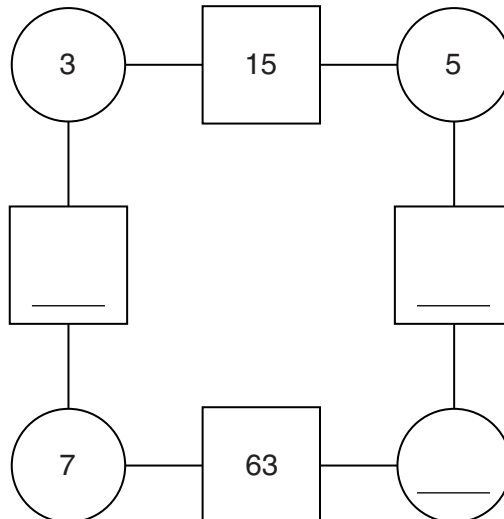
(i) $\boxed{} + 37 = 100$ [1]

(ii) $\text{£}1 - \boxed{} \text{p} = \text{£}0.82$ [1]

(b) Here is the rule for the diagram below.

Multiply the numbers in the two circles to give the number in the square between the circles.

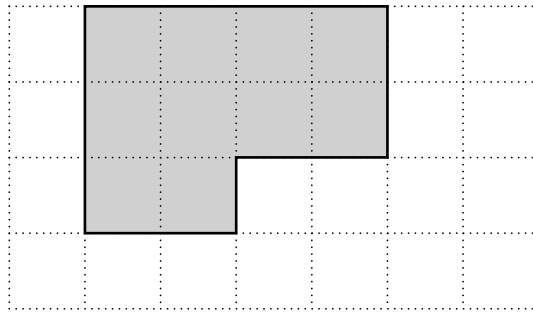
Complete the diagram.



[3]

5

- 3 (a) A shape has been drawn on the centimetre square grid.



- (i) Find the area of the shape.

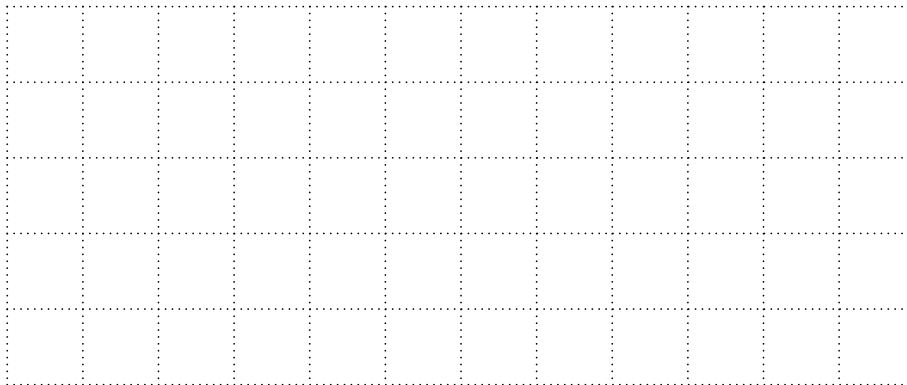
(a)(i) _____ cm^2 [1]

- (ii) Find the perimeter of the shape.

(ii) _____ cm [1]

- (b) Draw the shapes described below on the centimetre square grids.

- (i) A rectangle with area 12 cm^2 and perimeter less than 16 cm .



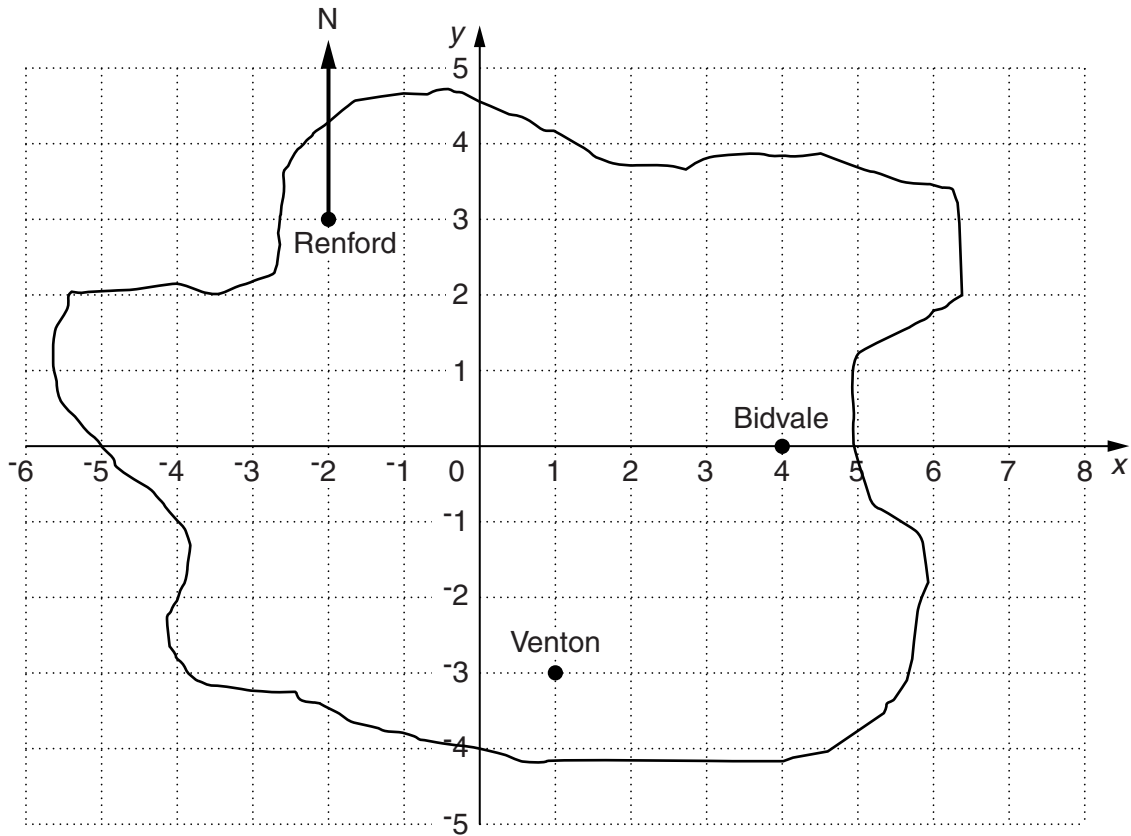
[2]

- (ii) A rectangle with area and perimeter that are numerically the same.



[2]

- 4 The grid shows a map of Goldham Island.
Three of the towns on the island are shown.



(a) Write down the coordinates of

(i) Renford,

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

(ii) Bidvale.

(ii) (_____ , _____) [1]

(b) Measure the bearing of Bidvale from Renford.

(b) _____ ° [1]

(c) The village of Acton is on a bearing of 270° from Bidvale.
Acton is closer to Renford than to Venton.

(i) Mark and label with a cross a possible position of Acton.

[2]

(ii) Write down the coordinates of your position of Acton.

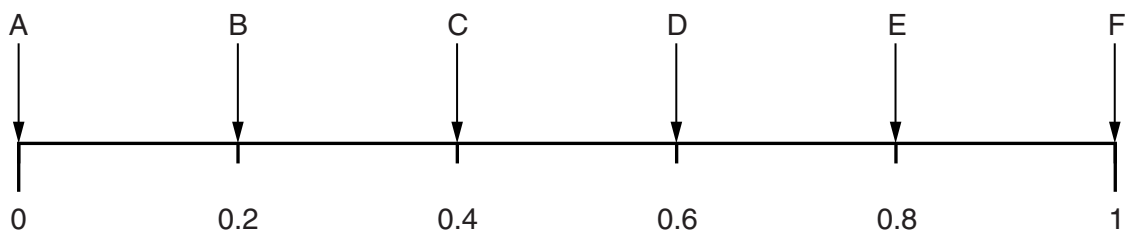
(c)(ii) (_____ , _____) [1]

5 Yasmin has 10 hair-slides in a box.

- 5 are green
- 2 are pink
- 2 are blue
- 1 is red

She chooses a hair-slide at random from her box.

Here is a probability line with some labelled arrows.



(a) (i) Choose an arrow from the line to complete these statements.

The probability that she takes a pink hair-slide is shown by arrow _____ .

The probability that she takes a red or a green hair-slide is shown by arrow _____ .

[2]

(ii) Draw an arrow on the line above to show the probability that she takes a green hair-slide. Label your arrow G.

[1]

(b) Yasmin buys 10 more hair-slides, 3 are green and 7 are blue. She places these in the box with the 10 hair-slides she already has. She chooses a hair-slide at random from her box.

Choose an arrow from the line above to complete this statement.

The probability that she takes a green hair-slide is shown by arrow _____ . [2]

8

6 (a) Find the value of x in the following equations.

(i) $x + 7 = 20$

(a)(i) _____ [1]

(ii) $6x = 42$

(ii) _____ [1]

(iii) $\frac{x}{4} = 20$

(iii) _____ [1]

(b) Simplify completely.

(i) $7a - 4a + 12a$

(b)(i) _____ [1]

(ii) $5x + 4 - 6x + 1$

(ii) _____ [2]

7 8 kg of potatoes cost £2.44.

Find the cost of 5 kg of these potatoes.

£ _____ [2]

9

8 (a) Find the volume of a cuboid measuring 25 mm by 20 mm by 40 mm.

(a) _____ mm^3 [2]

(b) Write your answer to part (a) in cubic centimetres (cm^3).

(b) _____ cm^3 [2]

10

- 9 (a) The timetable below shows the times of the Talylyn Railway from Tywyn Wharf to Nant Gwernol during one day.

Tywyn Wharf	10 30	11 40	12 15	13 20	14 30	15 05	16 10
Rhydyronen	10 42	11 52	12 27	13 32	14 42	15 17	16 22
Dolgoch Falls	11 01	12 11	12 48	13 53	15 01	15 38	16 43
Abergynolwyn	11 15	12 25	13 00	14 05	15 15	15 50	16 55
Nant Gwernol	11 23	12 33	13 08	14 13	15 23	15 58	17 18

- (i) How many trains leave Tywyn Wharf during the afternoon?

(a)(i) _____ [1]

- (ii) At what time does the 11 40 train from Tywyn Wharf arrive at Nant Gwernol?

(ii) _____ [1]

- (iii) How long, in minutes, is the journey on the 11 40 train from Tywyn Wharf to Nant Gwernol?

(iii) _____ minutes [1]

- (b) The return timetable from Nant Gwernol to Tywyn Wharf is shown below.

Nant Gwernol	11 35	12 45	13 20	14 25	15 35	16 10	17 27
Abergynolwyn	11 41	12 51	13 26	14 31	15 41	16 16	17 33
Dolgoch Falls	12 24	13 29	14 06	15 14	16 19	16 56	17 49
Rhydyronen	12 39	13 44	14 21	15 29	16 34	17 11	18 04
Tywyn Wharf	12 55	14 00	14 40	15 45	16 50	17 27	18 20

Sam catches the 11 40 train from Tywyn Wharf to Nant Gwernol. He must arrive back at Tywyn Wharf no later than 17 00.

What is the longest time Sam could spend in Nant Gwernol?

(b) _____ [2]

11

- (c) Mr and Mrs Townley have two children aged 4 and 10. They are going to travel on the railway from Tywyn Wharf to Nant Gwernol and then back to Tywyn Wharf.

The costs of travel are shown below.

Adult	Return £13.00
Child (5–15 years)	£3.00
Family (2 adults + 1 child over 5)	£28.50
Under 5 years travel FREE.	

How much cheaper is it to buy a family ticket than to buy individual tickets?

(c) £ _____ [2]

10 (a) Calculate.

(i) 7.5^2

(a)(i) _____ [1]

(ii) $\sqrt{62.41} + 3$

(ii) _____ [1]

(iii) $\frac{18.6 - 2.1}{5}$

(iii) _____ [1]

(b) (i) Round 346.78 to the nearest whole number.

(b)(i) _____ [1]

(ii) Round 346.78 to one decimal place.

(ii) _____ [1]

(iii) Round 346.78 to one significant figure.

(iii) _____ [1]

11 Naomi wins £1200 in a lottery.

She spends $\frac{1}{4}$ of the money on a laptop and she gives $\frac{1}{10}$ of the money to her parents.

How much money does she have left?

£ _____ [3]

12 (a) Simplify.

(i) $4a \times 5$

(a)(i) _____ [1]

(ii) $\frac{18y}{6}$

(ii) _____ [1]

(b) Work out the value of

(i) x^3 when $x = 6$,

(b)(i) _____ [1]

(ii) $2x^2 + 3$ when $x = 4$,

(ii) _____ [1]

(iii) $16 - x^2$ when $x = 3$.

(iii) _____ [1]

(c) Complete the following.

$$5(3x - 2) = 15x - \boxed{}$$

[1]

13 (a) Complete the following.

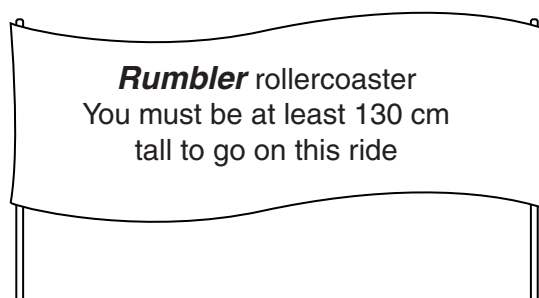
(i) 500 millimetres = _____ centimetres [1]

(ii) 2.4 litres = 2400 _____ [1]

(iii) 4.1 kg + 800 g = _____ [2]

(iv) _____ metres + 40 _____ = 3.7 metres [2]

(b)



Jackie wants to ride the *Rumbler* rollercoaster at the funfair.
She is 4 feet 7 inches tall.

12 inches = 1 foot
1 inch is approximately 2.5 cm

Use this information to decide if Jackie is allowed to ride the *Rumbler* rollercoaster.
Show your working clearly.

[4]

15

14* The cost of the same model of television in a French shop and an American shop is shown below.

French shop



€625

American shop



\$850

These are the exchange rates.

$$£1 = €1.12$$

$$£1 = \$1.68$$

In which shop is the television cheaper, and by how much?

The television in the _____ shop is cheaper by _____ [6]

16

15 Janet and Phil go to a summer fair.

Three cakes are left for sale on the cake stall.

Fruit cake (F)	Chocolate cake (C)	Sponge cake (S)
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Janet buys one of these cakes at random and then Phil buys one of the remaining cakes at random.

- (a) List all the possible ways they could do this.
The first one has been done for you.

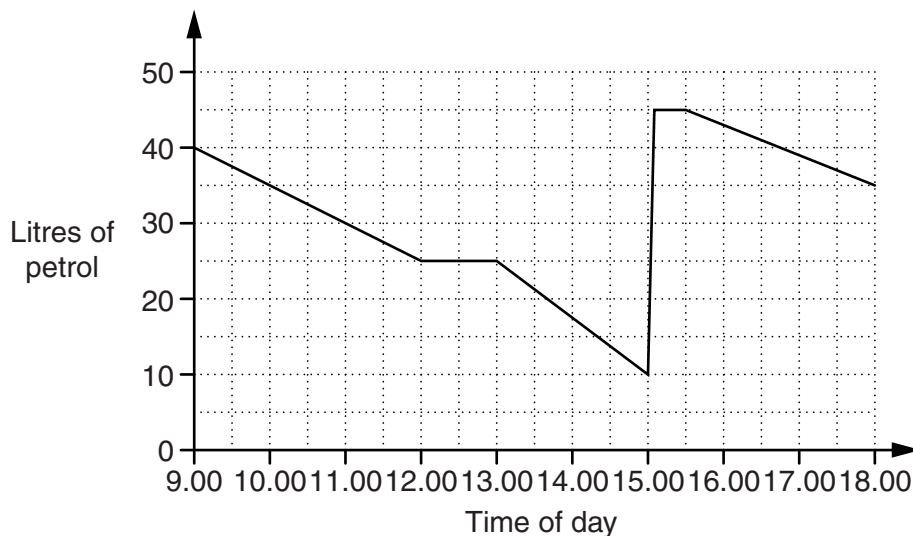
Janet	Phil
F	C

[2]

- (b) What is the probability that either Janet or Phil buys the chocolate cake?

(b) _____ [2]

- 16** Nisha goes on holiday in her car.
The graph shows how many litres of petrol are in the tank of her car during the journey.



- (a) (i)** How many litres of petrol were in the tank at the start of the journey?

(a)(i) _____ litres [1]

- (ii)** How many litres of petrol did the car use in the first 3 hours of the journey?

(ii) _____ litres [1]

- (iii)** Work out how many litres of petrol per hour the car was using during the first 3 hours of the journey.

(iii) _____ litres/hour [2]

- (b)** What could have happened

- (i)** between 12.00 and 13.00,

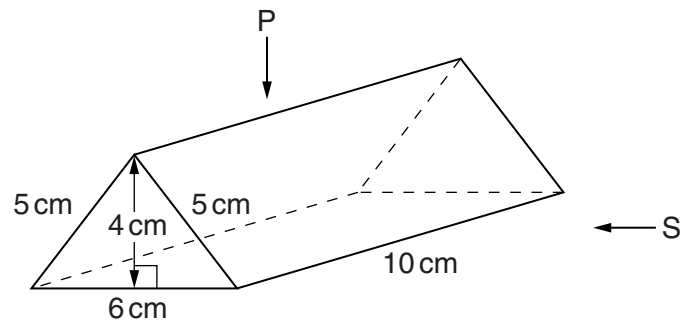
_____ [1]

- (ii)** at 15.00?

_____ [1]

18

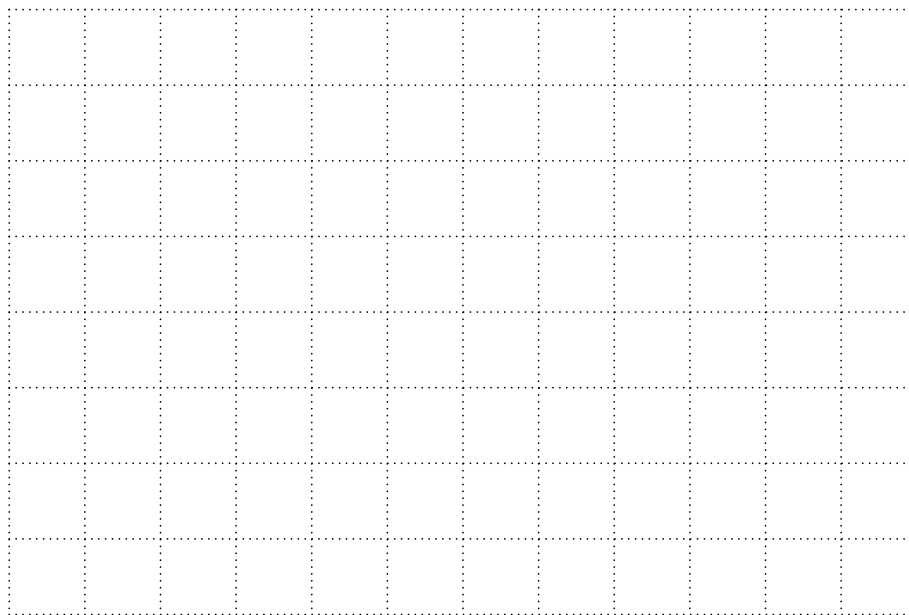
17 A chocolate bar is contained in a closed box which is a triangular prism.



(a) Make an accurate, full-size drawing of

- (i) the plan (from P) and
- (ii) the side elevation (from S) of the prism.

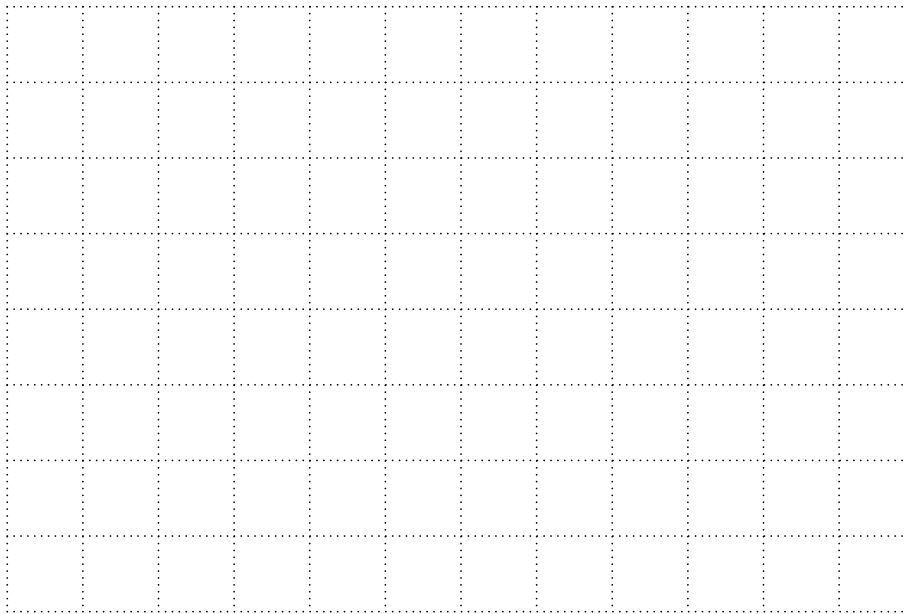
(i) Plan



[2]

19

(ii) Side elevation



[2]

(b) The box is made from card.

What is the total area of card needed to make the box?

(b) _____ cm² [4]

20

- 18 The table shows the probabilities of how a randomly selected adult in a particular town would vote in an election.

Party	Conservative	Liberal Democrat	Labour	Other
Probability	0.4	0.17	0.35	

- (a) Complete the table. [2]
- (b) Work out the probability that a randomly selected adult would vote Conservative or Liberal Democrat.

(b) _____ [2]

- (c) There are 2500 adults in the town.

How many of these adults might you expect to vote Labour?

(c) _____ [2]

END OF QUESTION PAPER



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