Write your name here

Surname	Other names

Centre Number | Candidate Number

Edexcel GCSE

Mathematics B

Unit 1: Statistics and Probability (Calculator)

Higher Tier

Monday 11 June 2012 – Afternoon
Time: 1 hour 15 minutes

Paper Reference
5MB1H/01

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used**.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.



Information

- The total mark for this paper is 60
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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6/6/7/3/3/3

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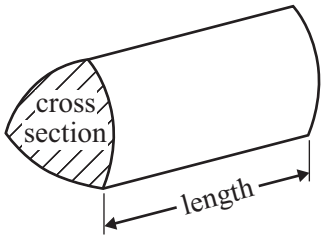
PEARSON

GCSE Mathematics 2MB01

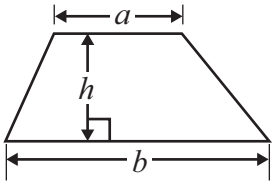
Formulae: Higher Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of prism = area of cross section × length

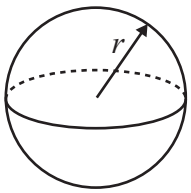


Area of trapezium $= \frac{1}{2}(a + b)h$



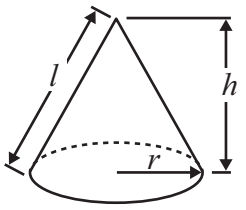
Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$

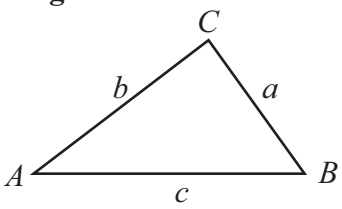


Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$



In any triangle *ABC*



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

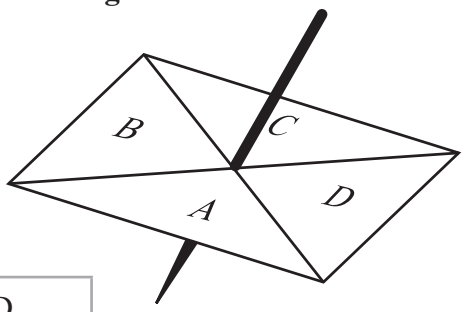
Area of triangle $= \frac{1}{2}ab \sin C$

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1 Sandy has a 4-sided spinner.
The sides of the spinner are labelled A, B, C and D.
The spinner is biased.



The table shows the probability that the spinner will land on A or on B or on C.

Side	A	B	C	D
Probability	0.15	0.32	0.27	

(a) Work out the probability that the spinner will land on D.

.....

(2)

Sandy spins the spinner 300 times.

(b) Work out an estimate for the number of times the spinner will land on A.

.....

(2)

(Total for Question 1 is 4 marks)

2 Stacey went to the theatre in Paris.

Her theatre ticket cost €96
The exchange rate was £1 = €1.20

(a) Work out the cost of her theatre ticket in pounds (£).

£ .....

(2)

Stacey bought a handbag in Paris.

The handbag cost €64.80
In Manchester, the same type of handbag costs £52.50

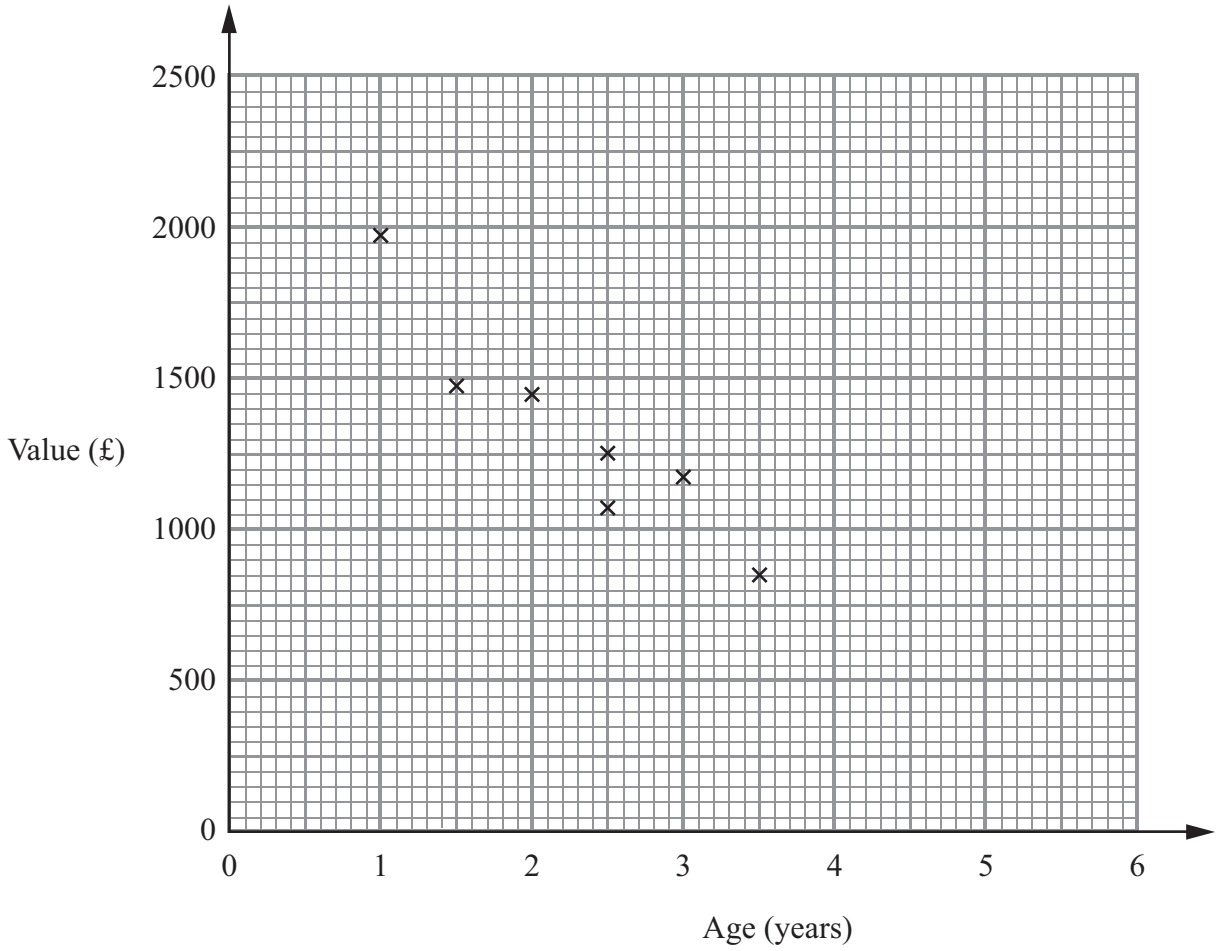
The exchange rate was £1 = €1.20

*(b) Compare the cost of the handbag in Paris with the cost of the handbag in Manchester.

(3)

(Total for Question 2 is 5 marks)

3 The scatter graph shows information about the ages and values of seven Varley motor scooters.



Another Varley motor scooter is 5 years old.
It has a value of £300

(a) Show this information on the scatter graph.

(1)

(b) Describe the relationship between the age and the value of Varley motor scooters.

.....

.....

(1)

A Varley motor scooter is 4 years old.

(c) Estimate its value.

£ .....

(2)

(Total for Question 3 is 4 marks)

***4** Pete and Sue are going to take their children to France.
They will travel together on the same ferry.
They will travel with one of two ferry companies, Easy Ferry or Seawagon.

The tables give information about the costs for each adult and each child to travel with these ferry companies.

Easy Ferry	**July**			**August**		
Date	**1 – 10**	**11 – 21**	**22 – 31**	**1 – 10**	**11 – 21**	**22 – 31**
Adult	£32.00	£36.50	£39.50	£42.25	£42.25	£37.75
Child	£18.00	£20.25	£23.75	£25.85	£25.85	£21.00

Seawagon	**July**			**August**		
Date	**1 – 10**	**11 – 21**	**22 – 31**	**1 – 10**	**11 – 21**	**22 – 31**
Adult	£33.50	£37.50	£40.25	£43.85	£44.95	£38.50
Child	£17.25	£19.75	£21.85	£24.65	£23.95	£19.95

The table below gives information about the discount they will get from each ferry company if they book early.

Early booking discount	
Easy Ferry	$\frac{1}{3}$ off
Seawagon	25% off

Pete and Sue have three children.
They will travel on 25 July.
They will book early.

Pete and Sue will travel with the cheaper ferry company.

Which ferry company?
You must show all your working.

(Total for Question 4 is 5 marks)

5 Jamal plays 15 games of ten-pin bowling.

Here are his scores.

72	59	75	66	79
75	66	63	89	76
65	79	77	71	83

(a) Draw an ordered stem and leaf diagram to show Jamal's scores.

(3)

Gill plays 15 games of ten-pin bowling.

The table gives some information about her scores.

Highest score	95
Lowest score	75
Mean score	80

*(b) Compare the distribution of Jamal's scores and the distribution of Gill's scores.

(5)

(Total for Question 5 is 8 marks)

6 The table gives information about the speeds of 75 cars on a road.

Speed (s km/h)	Frequency		
$30 \leqslant s < 40$	7		
$40 \leqslant s < 50$	22		
$50 \leqslant s < 60$	34		
$60 \leqslant s < 70$	12		

Work out an estimate for the mean speed.

..... km/h

(Total for Question 6 is 4 marks)

7 The table shows information about the lengths, in seconds, of 40 TV adverts.

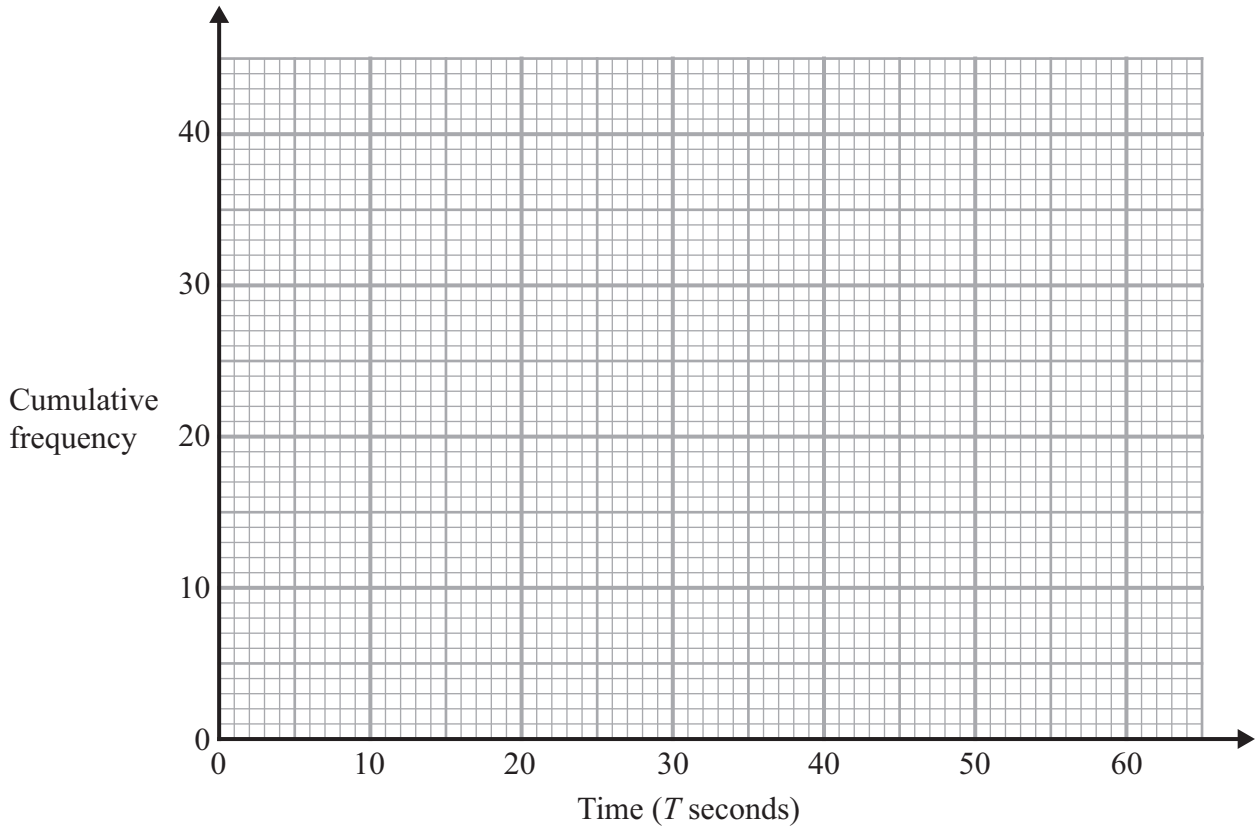
Time (T seconds)	Frequency
$10 < T \leqslant 20$	4
$20 < T \leqslant 30$	7
$30 < T \leqslant 40$	13
$40 < T \leqslant 50$	12
$50 < T \leqslant 60$	4

(a) Complete the cumulative frequency table for this information.

Time (T seconds)	Cumulative frequency
$10 < T \leqslant 20$	4
$10 < T \leqslant 30$	
$10 < T \leqslant 40$	
$10 < T \leqslant 50$	
$10 < T \leqslant 60$	

(1)

(b) On the grid, draw a cumulative frequency graph for your table.



(2)

(c) Use your graph to find an estimate for the median length of these TV adverts.

..... seconds

(1)

(Total for Question 7 is 4 marks)

8 23 girls have a mean height of 153 cm.
17 boys have a mean height of 165 cm.

Work out the mean height of all 40 children.

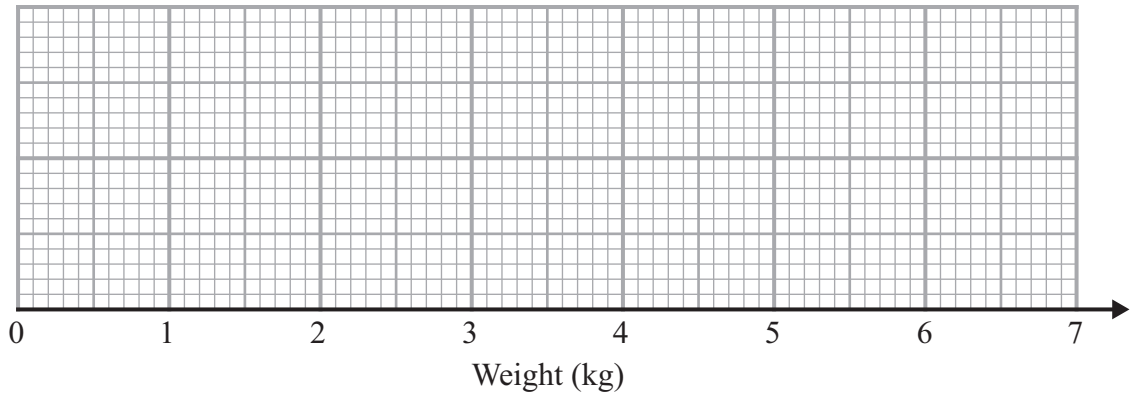
..... cm

(Total for Question 8 is 3 marks)

9 The table gives some information about the weights of 60 babies.

Lowest	2.0 kg
Highest	6.5 kg
Lower quartile	2.8 kg
Upper quartile	4.2 kg
Median	3.0 kg

(a) Draw a box plot to show this information.



(2)

There are 60 babies.

(b) Work out an estimate for the number of these babies with a weight greater than 2.8 kg.

.....

(2)

(Total for Question 9 is 4 marks)

10 Simon is designing a questionnaire for people who visit his sports club.

He wants to find out how often people visit his sports club.

(a) Design a suitable question he could use.

(2)

Simon asks 10 of his friends who visit his sports club to do his questionnaire.
This may **not** be a suitable sample.

(b) Give one reason why.

.....

.....

(1)

There are 365 runners in Simon's sports club.

The table gives information about these runners.

Age (in years)	Number of male runners	Number of female runners
10 − 19	35	36
20 − 29	52	48
30 − 39	45	32
40 − 49	37	29
50 − 69	20	31

Simon surveys the runners in his sports club.
He uses a sample of 50 runners stratified by gender and by age.

(c) Work out the number of male runners with an age 30 – 39 years he should have in his sample.

.....

(2)

(Total for Question 10 is 5 marks)

11 There are N beads in a jar.
40 of these beads are black.

Julie takes at random a sample of 50 beads from the jar.
5 of the beads in her sample are black.

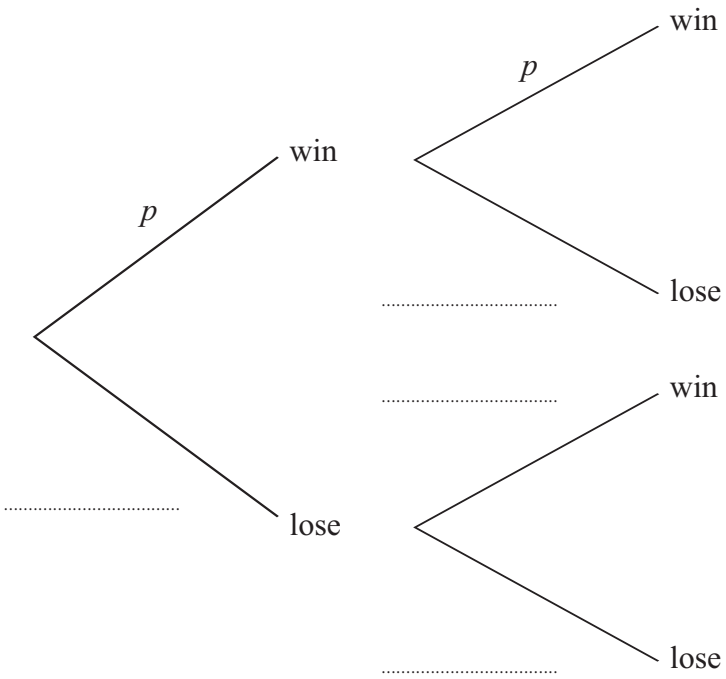
Work out an estimate for the value of N.

.....

(Total for Question 11 is 2 marks)

12 The probability that Rebecca will win any game of snooker is p.
She plays two games of snooker.

(a) Complete, in terms of p, the probability tree diagram.



(2)

(b) Write down an expression, in terms of p, for the probability that Rebecca will win both games.

.....

(1)

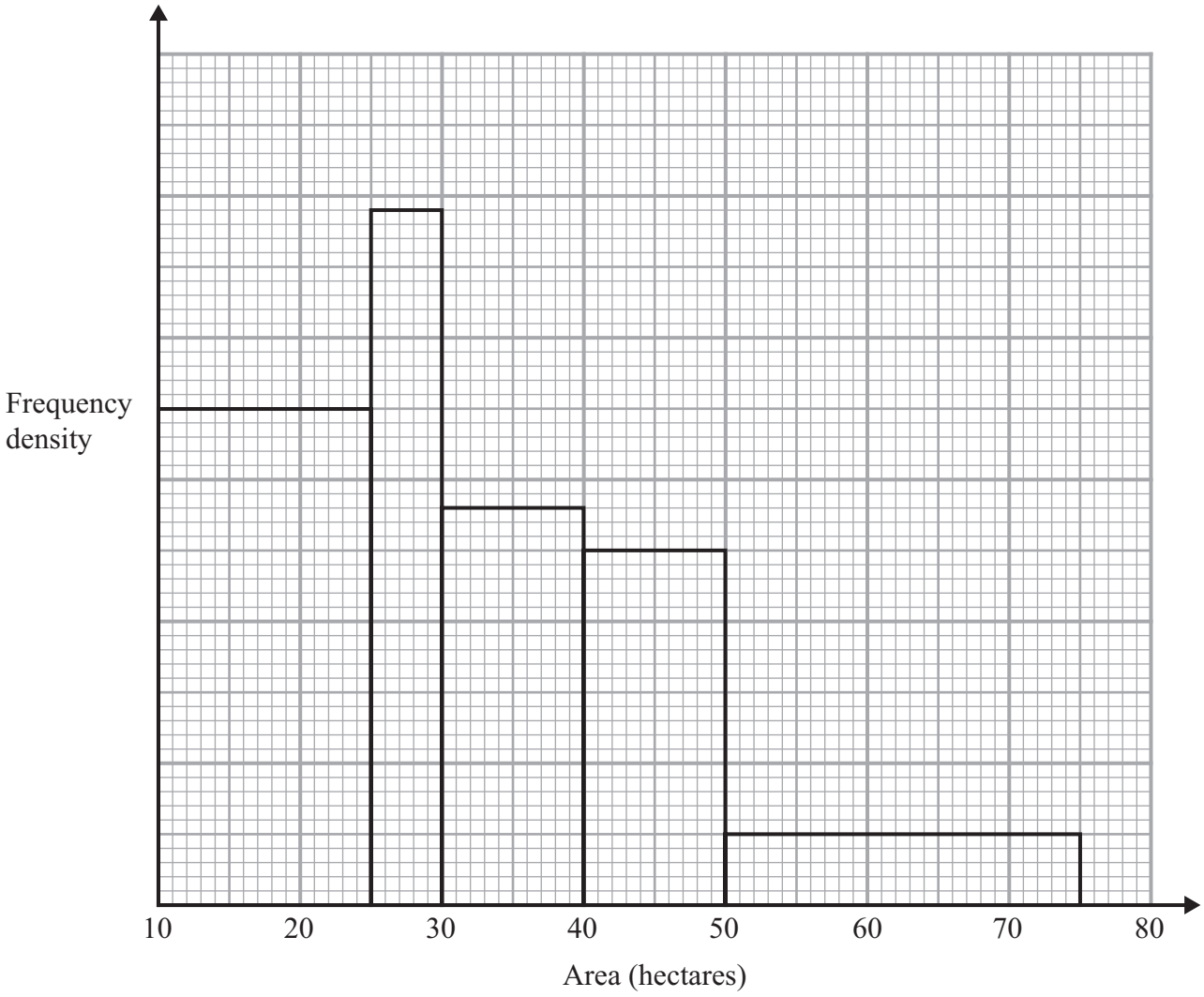
(c) Write down an expression, in terms of p, for the probability that Rebecca will win exactly one of the games.

.....

(2)

(Total for Question 12 is 5 marks)

13 The histogram gives information about the areas of 285 farms.

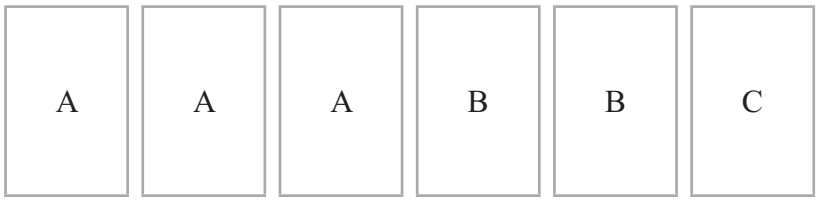


Work out an estimate for the number of these farms with an area greater than 38 hectares.

.....

(Total for Question 13 is 3 marks)

14 Here are some cards.
Each card has a letter on it.



Rachel takes at random two of these cards.

Work out the probability that there are different letters on the two cards.

.....

(Total for Question 14 is 4 marks)

TOTAL FOR PAPER IS 60 MARKS

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