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**Higher GCSE Mathematics Revision Pack**

**DATA HANDLING – NON-CALC**

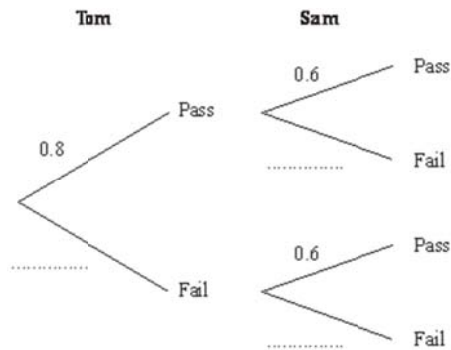
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**Q1.** Tom and Sam each take a driving test.

The probability that Tom will pass the driving test is 0.8

The probability that Sam will pass the driving test is 0.6

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that both Tom and Sam will pass the driving test.

.....

(2)

(c) Work out the probability that only one of them will pass the driving test.

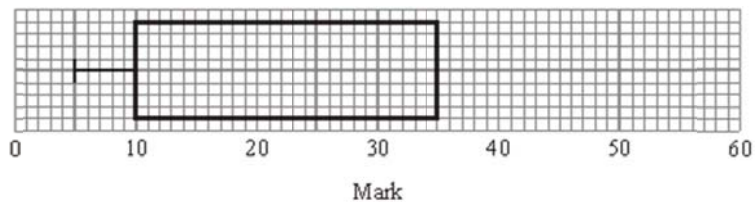
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(3)

**(Total 7 marks)**

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**Q2.** The incomplete box plot and table show some information about some marks.



	Mark
Lowest mark	5
Lower quartile	
Median	30
Upper quartile	35
Highest mark	55

(a) Use the information in the table to complete the box plot.

(2)

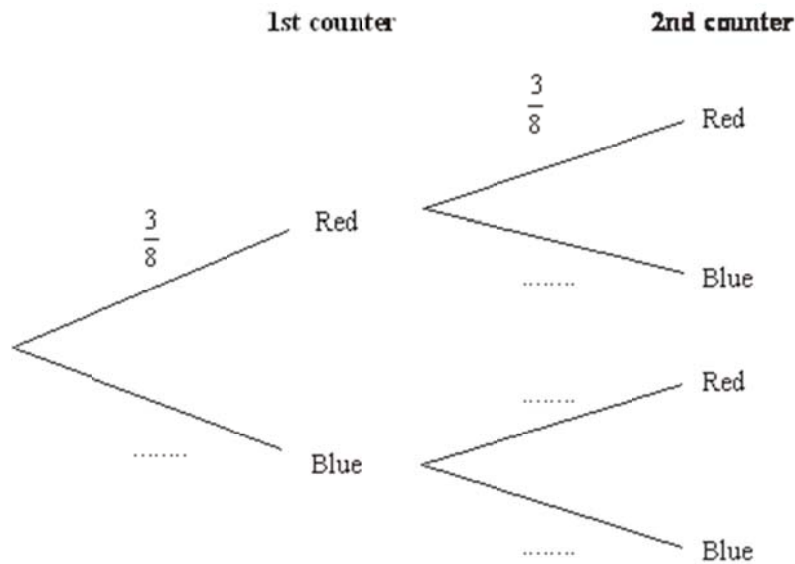
(b) Use the information in the box plot to complete the table.

(1)

(Total 3 marks)

**Q3.** Matthew puts 3 red counters and 5 blue counters in a bag.  
He takes at random a counter from the bag.  
He writes down the colour of the counter.  
He puts the counter in the bag again.  
He then takes at random a second counter from the bag.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Matthew takes two red counters.

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(2)

(Total 4 marks)

**Q4.** The table shows information about the amount spent by 100 customers in a supermarket.

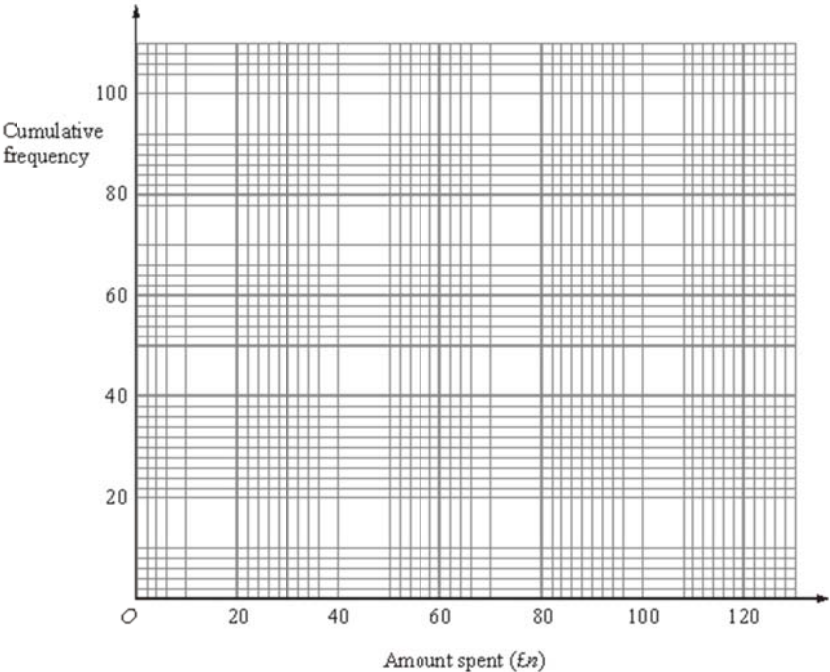
Amount spent (£ <i>n</i> )	Frequency
$0 < n \leq 20$	18
$20 < n \leq 40$	22
$40 < n \leq 60$	35
$60 < n \leq 80$	15
$80 < n \leq 100$	8
$100 < n \leq 120$	2

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

Amount spent (£ <i>n</i> )	Cumulative frequency
$0 < n \leq 20$	18
$0 < n \leq 40$	
$0 < n \leq 60$	
$0 < n \leq 80$	
$0 < n \leq 100$	
$0 < n \leq 120$	

(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 amount spent.

£ .....

(1)

(Total 4 marks)

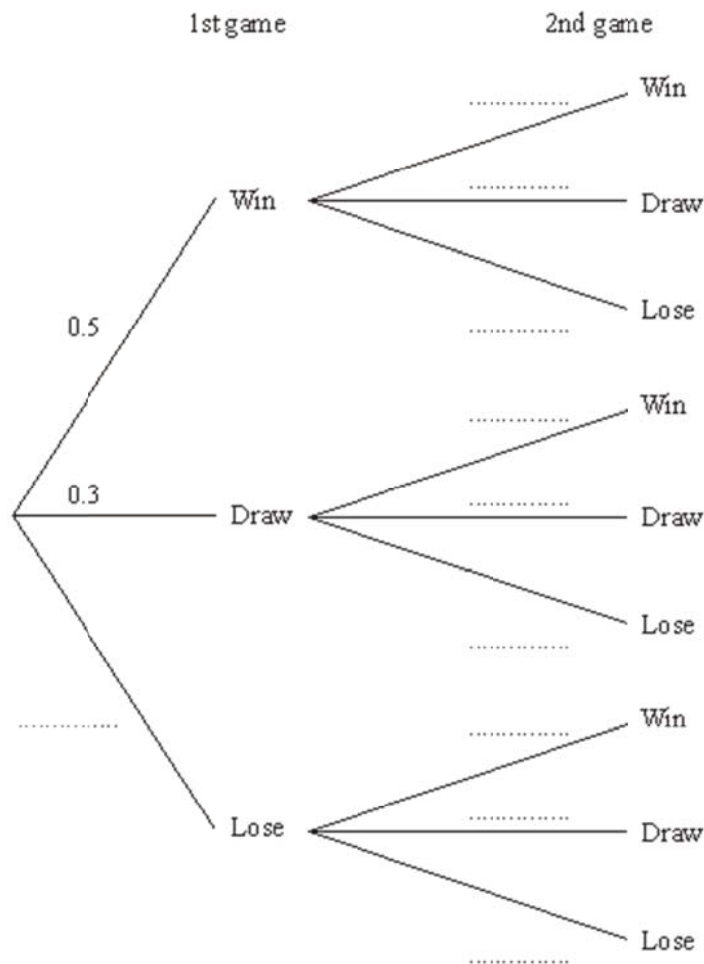
**Q5.** In a game of chess, a player can either win, draw or lose.

The probability that Vishi wins any game of chess is 0.5.

The probability that Vishi draws any game of chess is 0.3.

Vishi plays 2 games of chess.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Vishi will win both games.

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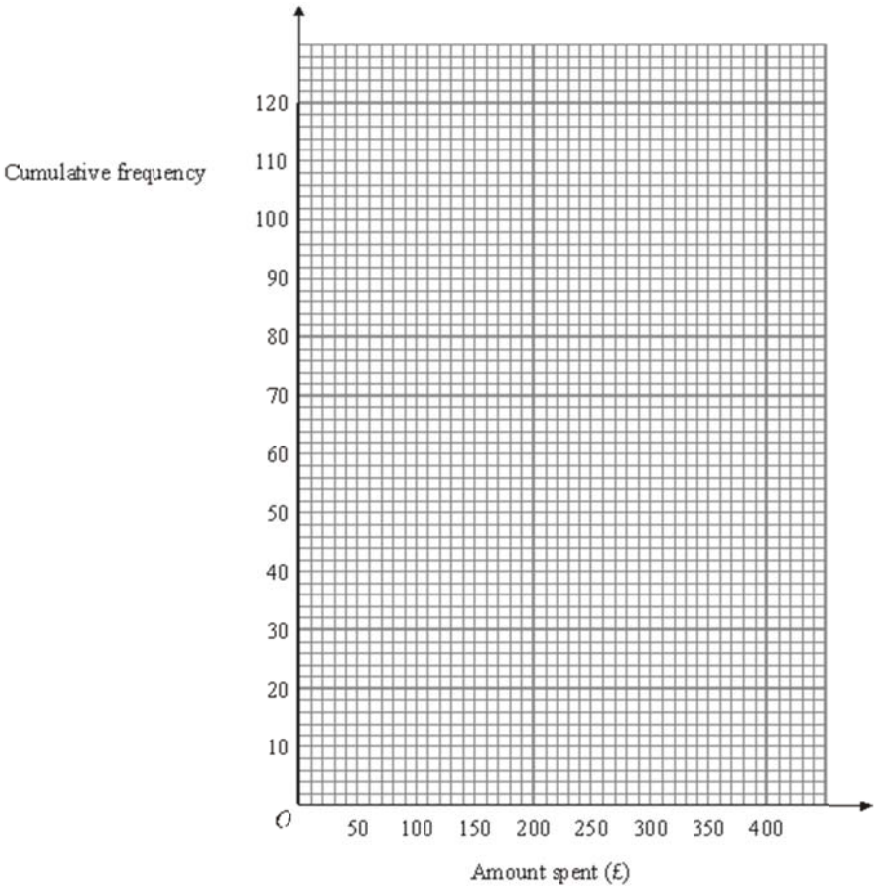
(2)

(Total 4 marks)

**Q6.** Lucy did a survey about the amounts of money spent by 120 men during their summer holidays. The cumulative frequency table gives some information about the amounts of money spent by the 120 men.

Amount (£A) spent	Cumulative frequency
$0 \leq A < 100$	13
$0 \leq A < 150$	25
$0 \leq A < 200$	42
$0 \leq A < 250$	64
$0 \leq A < 300$	93
$0 \leq A < 350$	110
$0 \leq A < 400$	120

(a) On the grid, draw a cumulative frequency diagram.



(2)

(b) Use your cumulative frequency diagram to estimate the median.

£ .....

(2)

A survey of the amounts of money spent by 200 women during their summer holidays gave a median of £205

- (c) Compare the amounts of money spent by the women with the amounts of money spent by the men.

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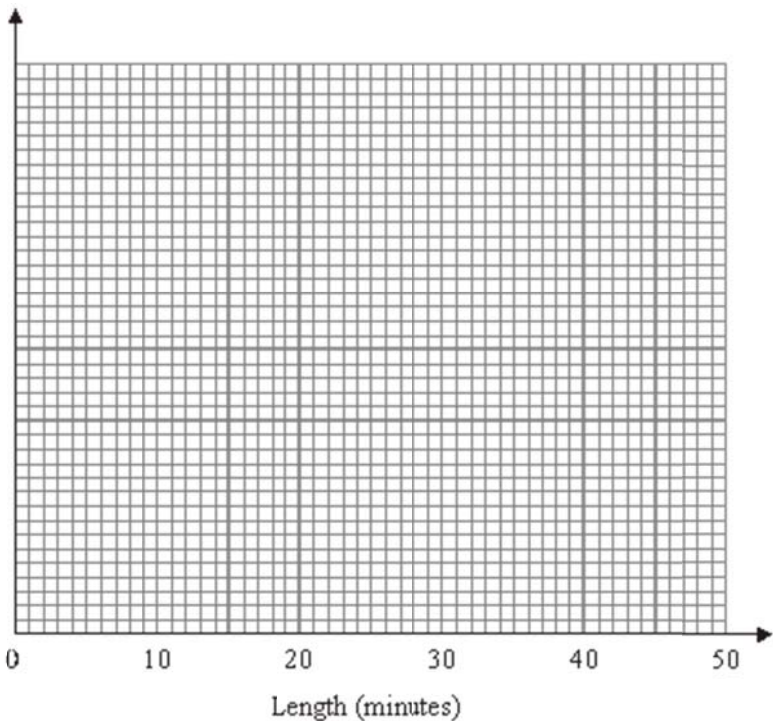
(1)

(Total 5 marks)

**Q7.** A call centre receives 64 telephone calls one morning.  
The table gives information about the lengths, in minutes, of these telephone calls.

Length ( $x$ ) minutes	Frequency
$0 < x \leq 5$	4
$5 < x \leq 15$	10
$15 < x \leq 30$	24
$30 < x \leq 40$	20
$40 < x \leq 45$	6

Draw a histogram for this information.



(Total 4 marks)

**Q8.** Mr Walton is responsible for maintaining fish stocks in a river. The table gives some information about the lengths, in centimetres, of a type of fish caught from the river.

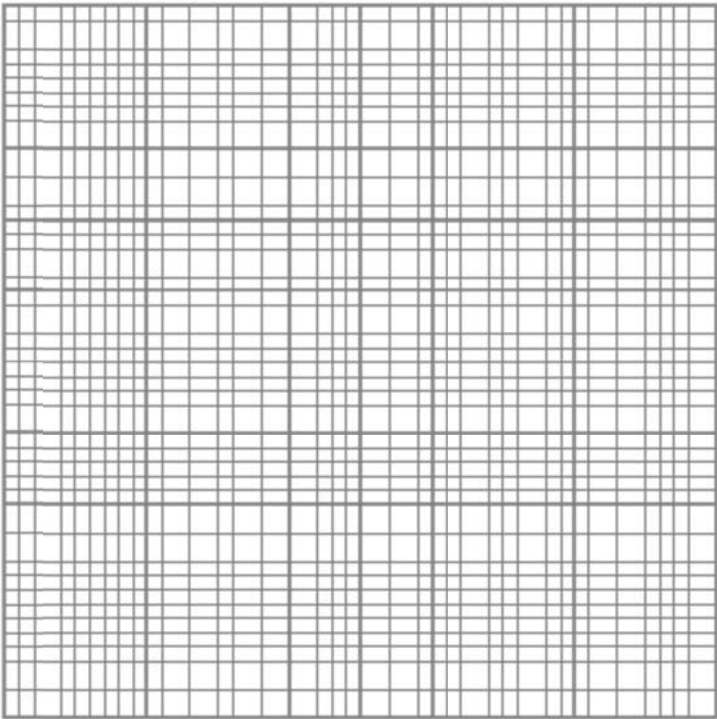
Length (L) cm	Frequency
$0 < L \leq 10$	40
$10 < L \leq 20$	60
$20 < L \leq 40$	90
$40 < L \leq 80$	60
$L > 80$	0

He wants to study the effect of returning to the river fish less than 50 cm in length that are caught.

Mr Walton suggests that fish which are less than 50 cm in length are returned to the river.

Draw a suitable statistical diagram for the information in the table.

Use it to find an estimate of the percentage of fish returned to the river.



..... %

**(Total 6 marks)**

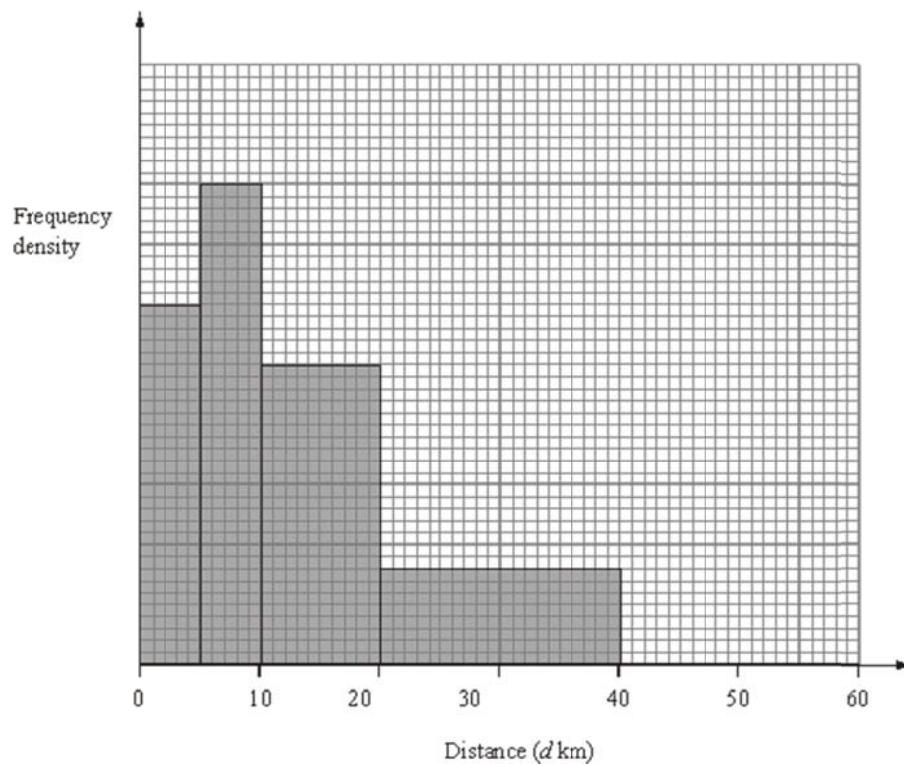
**Q9.** There are 10 students in a class. 6 of the students are boys and 4 of the students are girls.

Three students are picked at random from the class to form a team.

Work out the probability that the team consists of 1 girl and 2 boys.

.....  
(Total 4 marks)

**Q10.** The incomplete histogram and table give some information about the distances some teachers travel to school.





- (a) Use the information in the histogram to complete the frequency table.

Distance ( $d$ km)	Frequency
$0 < d \leq 5$	15
$5 < d \leq 10$	20
$10 < d \leq 20$	
$20 < d \leq 40$	
$40 < d \leq 60$	10

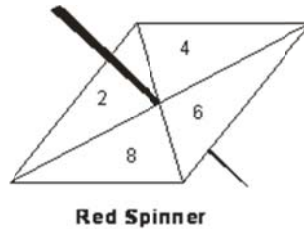
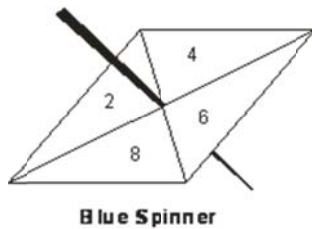
(2)

- (b) Use the information in the table to complete the histogram.

(1)

(Total 3 marks)

**Q11.** Here are two fair 4-sided spinners.  
One is a Blue spinner and one is a Red spinner.



Blue spinner Red spinner

Each spinner has four sections numbered 2, 4, 6 and 8

Each spinner is to be spun once.

Total score = Blue spinner score + Red spinner score.

- (a) Find the probability that the total score will be 10.

.....

(3)

Ali and Shazia play a game. In each round of the game, Ali spins the Blue spinner once and Shazia spins the Red spinner once.

Ali wins when the Blue spinner score is greater than the Red spinner score.

Ali and Shazia play 80 rounds.

- (b) Work out an estimate of the number of rounds that Ali will win.

.....  
(3)

(Total 6 marks)

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**Q12.**



The diagram represents 100 cards. Each card has a whole number from 1 to 100 on it.

No cards have the same number.

Bill puts a red dot on every card which has a multiple of 6 on it.

Parul puts a green dot on every card which has a multiple of 9 on it.

All the cards are placed in a bag.

Vicki selects a card at random.

What is the probability that the card has both a red and a green dot on it?

.....  
(Total 3 marks)

**M1.**

	Working	Answer	Mark	Additional Guidance
(a)		0.2 and 0.4, 0.4	2	<b>B1</b> for 0.2 oe on LH branch <b>B1</b> for 0.4 oe on both RH branches
(b)	$0.8 \times 0.6$	0.48	2	<b>M1</b> for $0.8 \times 0.6$ oe <b>A1</b> for 0.48 oe
(c)	$0.8 \times 0.4 + 0.2 \times 0.6$	0.44	3	<b>M1</b> for $0.8 \times '0.4'$ or $'0.2' \times 0.6$ oe <b>M1</b> for $0.8 \times '0.4' + '0.2' \times 0.6$ oe <b>A1</b> for 0.44 oe  <b>OR</b> <b>M1</b> for $'0.2' \times '0.4'$ oe <b>M1</b> for $1 - ('0.8 \times 0.6' + '0.2' \times '0.4')$ oe <b>A1</b> for 0.44 oe
Total for Question: 7 marks				

**M2.**

	Working	Answer	Mark	Additional Guidance
(a)	Complete box plot	Median Highest mark	2	<b>B1</b> line drawn at 30 and no other lines drawn within box <b>B1</b> whisker drawn to 55
(b)	Complete table	10	1	<b>B1</b> for 10
Total for Question: 3 marks				

**M3.**

	Working	Answer	Mark	Additional Guidance
(a)		$\frac{5}{8}$ $\frac{5}{8}, \frac{3}{8}, \frac{5}{8}$	2	$\frac{5}{8}$ correct for 1 <sup>st</sup> counter $\frac{5}{8}, \frac{3}{8}, \frac{5}{8}$ correct for 2 <sup>nd</sup> counter

(b)	$\frac{3}{8} \times \frac{3}{8}$	$\frac{9}{64}$ oe	2	<b>M1</b> for $\frac{3}{8} \times \frac{3}{8}$ <b>A1</b> for $\frac{9}{64}$ oe
Total for Question: 4 marks				

**M4.**

	Answer	Mark	Additional Guidance
(a)	(18), 40, 75, 90, 98, 100	1	<b>B1</b> for all correct
(b)		2	<b>B1</b> ft for 5 or 6 points plotted correctly $\pm 1$ full (2mm) square at the end of interval dep on sensible table (condone 1 addition error) <b>B1</b> (dep) for points joined by curve or line segments provided no gradient is negative – ignore any part of graph outside range of their points (SC: <b>B1</b> if 5 or 6 points plotted not at end but consistent within each interval and joined)
(c)	approx 46	1	<b>B1</b> (ft dep on graph being cf) for reading from graph at $50 \pm 1$ full (2mm) square
Total for Question: 4 marks			

**M5.**

	Working	Answer	Mark	Additional Guidance
(a)		Correct diagram	2	<b>B1</b> for 0.2 oe seen on bottom left branch <b>B1</b> for correct probabilities on other branches
(b)	$\text{prob}(WW) = 0.5 \times 0.5$	0.25	2	<b>M1</b> for $0.5 \times '0.5'$ <b>A1ft</b> for 0.25 oe
Total for Question: 4 marks				

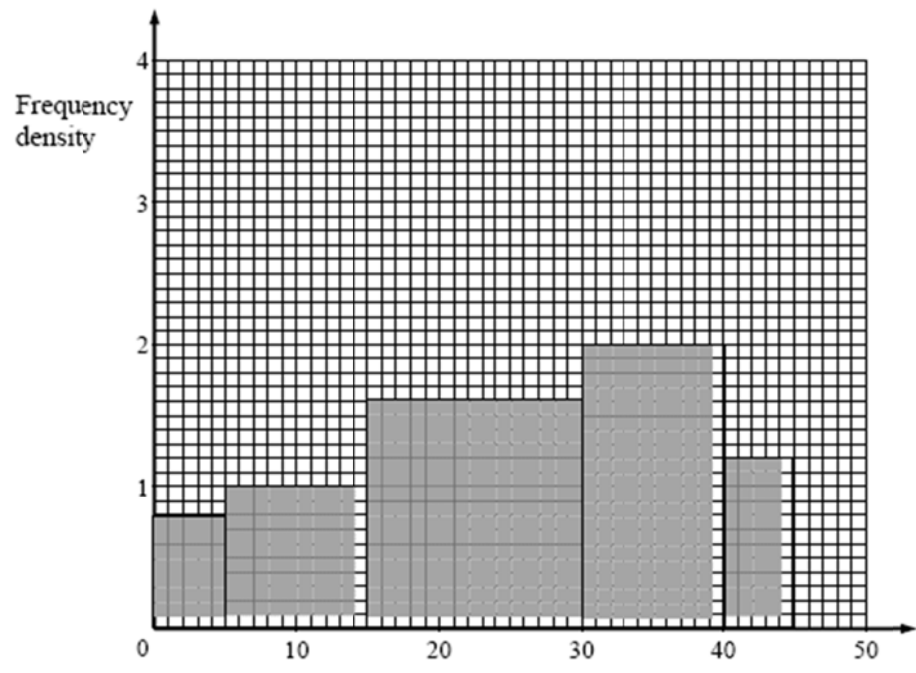
**M6.**

	Answer	Mark	Additional Guidance
(a)	Ogive	2	<b>B1</b> 6 or 7 points plotted correctly $\pm 1$ full (2mm) square <b>B1</b> (dep) for points joined by curve or line segments provided no gradient is negative – ignore any part of graph outside range of their points (SC: <b>B1</b> if 6 or 7 points plotted not at end but consistent within each interval and joined)
(b)	240	2	<b>B2</b> if answer is in the range 235 – 245 <b>OR</b> <b>M1</b> (dep on graph being cf) for using cf = 60 or 60.5 <b>A1</b> ft ( $\pm 1$ square)
(c)		1	<b>B1</b> ft correct comment comparing money spent by men with money spent by women
Total for Question: 5 marks			

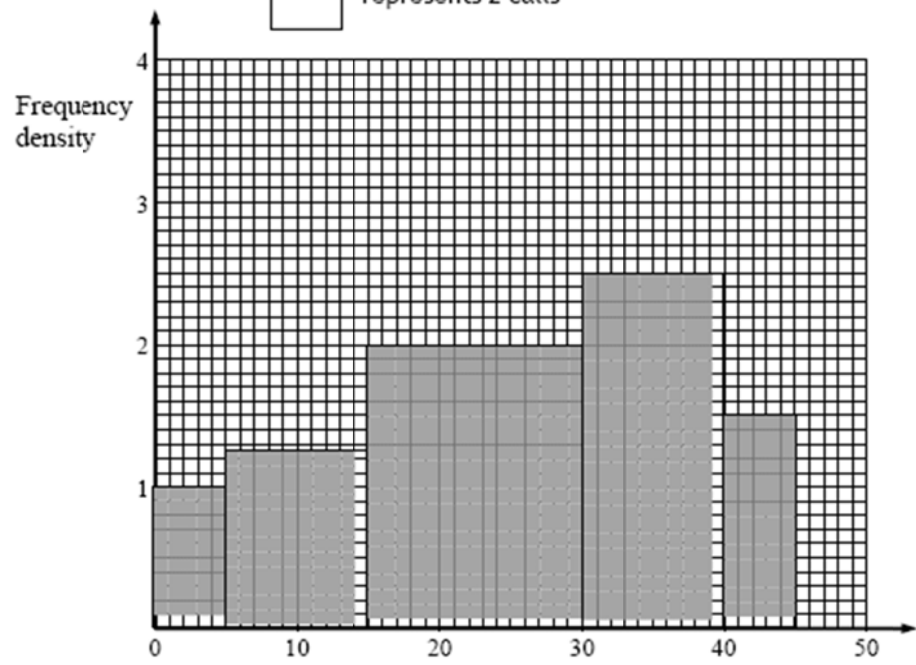
**M7.**

Working						Answer	Mark	Additional Guidance
F	4	10	24	20	6	Correct histogram	4	<b>M1</b> use of frequency density as two frequency ÷ width (can be implied by correct frequency densities or two correct bars with different widths) or area (can be implied by one correct bar) to represent frequency  <b>A2</b> for all 5 histogram bars correct ±½ square ( <b>A1</b> at least 3 correct histogram bars ±½ square)  <b>A1</b> for correct label and scale numbered appropriately <b>or</b> for key and consistent scaling
Fd	0.8	1	1.6	2	1.2			
or								
F	4	10	24	20	6			
Fd	4	5	8	10	6			
Total for Question: 4 marks								

Examples



□ represents 2 calls



Working	Answer	Mark	Additional Guidance																								
<table border="1"> <thead> <tr> <th>L</th><th>F</th><th>FD</th><th>CF</th></tr> </thead> <tbody> <tr> <td>0–10</td><td>40</td><td>4</td><td>40</td></tr> <tr> <td>10–20</td><td>60</td><td>6</td><td>100</td></tr> <tr> <td>20–40</td><td>90</td><td>4.5</td><td>190</td></tr> <tr> <td>40–80</td><td>60</td><td>1.5</td><td>250</td></tr> <tr> <td>&gt;80</td><td>0</td><td>0</td><td>250</td></tr> </tbody> </table>	L	F	FD	CF	0–10	40	4	40	10–20	60	6	100	20–40	90	4.5	190	40–80	60	1.5	250	>80	0	0	250	<p>Histogram</p> <p><b>OR</b></p> <p>Cumulative Frequency polygon</p> <p>82%</p>	6	<p><b>B1</b> Scales labelled and also marked on the vertical axis with frequency density or with cumulative frequency</p> <p><b>M1</b> frequency densities calculated, at least one non-trivial one correct.</p> <p><b>A1</b> all correctly plotted (M1 cumulative frequencies correct)</p> <p><b>M1</b> Use 50 on the horizontal scale of CF diagram read off vertical axis (200–210)</p> <p><b>or</b> Use 50 on the horizontal scale of a histogram and covert area to the left to a frequency</p> <p><b>M1</b> convert to a percentage</p> <p><b>A1</b> 80 – 85</p>
L	F	FD	CF																								
0–10	40	4	40																								
10–20	60	6	100																								
20–40	90	4.5	190																								
40–80	60	1.5	250																								
>80	0	0	250																								
Total for Question: 6 marks																											

M9.

Working	Answer	Mark	Additional Guidance
$\frac{4}{10} \times \frac{6}{9} \times \frac{5}{8} = \frac{120}{720}$ $\frac{120}{720} + \frac{6}{10} \times \frac{5}{9} \times \frac{4}{8} + \frac{6}{10} \times \frac{4}{9} \times \frac{5}{8}$	$\frac{360}{720}$	4	<p><b>M1</b> for <math>\frac{4}{10} \times \frac{6}{9} \times \frac{5}{8}</math></p> <p><b>A1</b> for <math>\frac{120}{720}</math></p> <p><b>M1</b> <math>\frac{'120'}{720} + 2</math> correct cases (M1 any 2 correct cases)</p> <p><b>or</b> <math>\frac{'120'}{720} \times 3</math></p> <p><b>A1</b> cao</p> <p>SC with replacement</p> <p><b>M1</b> <math>\frac{4}{10} \times \frac{6}{10} \times \frac{6}{10}</math></p>

			<b>M1</b> $\frac{4}{10} \times \frac{6}{10} \times \frac{6}{10} \times 3$
<b>Total for Question: 4 marks</b>			

**M10.**

	Answer	Mark	Additional Guidance
(a)	25 16	2	<b>M1</b> for correct use of frequency density to find a unit of area (for example 1 cm <sup>2</sup> = 2.5 or 1 small square = 0.1) or the area of one block. <b>A1</b> cao
(b)	Correct black (1 cm high between 40 and 60)	1	<b>B1</b> for correct black
<b>Total for Question: 3 marks</b>			

**M11.**

	Working	Answer	Mark	Additional Guidance
(a)	4 6 8 10 6 8 10 12 8 10 12 14 10 12 14 16 <b>OR</b> $\frac{1}{4} \times \frac{1}{4}$ $\frac{1}{4} \times \frac{1}{4} \times 4$	$\frac{4}{16}$	3	<b>M1</b> Attempts to list all outcome pairs <b>A1</b> all 16 found <b>A1</b> cao <b>OR</b> <b>M2</b> $\frac{1}{4} \times \frac{1}{4} \times 4$ (M1 $\frac{1}{4} \times \frac{1}{4} \times 1$ , 2 or 3) $\frac{4}{16}$ <b>A1</b> $\frac{4}{16}$ oe
(b)	Prob Ali wins = $\frac{6}{16}$ Number of wins = $\frac{6}{16} \times 80$	30	3	<b>B1</b> Prob Ali wins = $\frac{6}{16}$ oe <b>M1</b> ' $\frac{6}{16}$ ', $\times 80$ <b>A1</b> ft
<b>Total for Question: 6 marks</b>				



**M12.**

Working	Answer	Mark	Additional Guidance
Reds 6, 12, 18, 24, 30... Greens 9, 18, 27...	$\frac{1}{20}$	3	<p><b>B1</b> list of red and green multiples (both to at least 18) or explicitly states 'LCM'</p> <p><b>B1</b> works out highest number (90 seen)</p> <p><b>B1</b> <math>\frac{1}{20}</math> (accept <math>\frac{5}{100}</math>)</p>
Total for Question: 3 marks			