

FULL MODEL ANSWERS**Q1. NON-CALCULATOR**

The table below shows some information about the number of times each student in a class was late last week.

Lates		Frequency	
0	x	15	= 0
1	x	8	= 8
2	x	3	= 6
3	x	3	= 9
4	x	1	= 4

Work out the mean number of lates per student.

TOTAL: 30 27

$$\begin{aligned} \text{Mean} &= \frac{27 \div 3}{30 \div 3} \\ &= \frac{9}{10} \end{aligned}$$

0.9

(Total for question = 3 marks)

Q2. CALCULATOR ALLOWED

Colour	Number of students
red	7
green	6
yellow	5
blue	10
other	2

Debra recorded the favourite colour of each of the 30 students in her class.

The incomplete table shows some information about her results.

(a) Complete the table for Debra's results.

$$30 - 7 - 6 - 5 - 10 = 2$$

(1)

(b) What is the modal colour?

category with highest frequency

Blue

(1)

(Total for question = 2 marks)

Q3. CALCULATOR ALLOWED

The table shows some information about the dress sizes of 25 women.

Dress size	Number of women
8	2
10	9
12	8
14	6

TOTAL: 25

(a) Find the median dress size.

$$\text{Middle position} = \frac{n+1}{2}$$

$$= \frac{25+1}{2}$$

$$= 13^{\text{th}} \text{ value}$$

← 13th value is in this group

Dress size 12

(1)

3 of the 25 women have a shoe size of 7

Zoe says that if you choose at random one of the 25 women, the probability that she has either a shoe size

of 7 or a dress size of 14 is $\frac{9}{25}$ because

Are they mutually exclusive?

$$\frac{3}{25} + \frac{6}{25} = \frac{9}{25}$$

(b) Is Zoe correct?

You must give a reason for your answer.

No, since some of the women may have both that shoe size and that dress size. They are not mutually exclusive.

(1)

(Total for question = 2 marks)

Q4. CALCULATOR ALLOWED

The table shows information about the numbers of points scored by 30 students in a quiz.

Number of points		Frequency
0	x	4 = 0
1	x	3 = 3
2	x	7 = 14
3	x	5 = 15
4	x	6 = 24
5	x	5 = 25 +
		TOTAL: 81

(a) Find the modal number of points.

(category with highest frequency) 2 points
(1)

(b) Work out the total number of points scored.

81
.....
(2)

(Total for question = 3 marks)

Q5. CALCULATOR ALLOWED

Ross rolled an ordinary dice 30 times.

The frequency table gives information about his results.

Score	Frequency
1	7
2	5
3	4
4	4
5	6
6	4

Ross worked out the mean score as 8

(a) Explain why it is impossible for the mean score to be 8

Look at the scores in the table

The highest score was 6, so the mean cannot be higher than 6.

(1)

Graham also worked out the mean score.

Here is his working.

$$1 \times 7 + 2 \times 5 + 3 \times 4 + 4 \times 4 + 5 \times 6 + 6 \times 4 = 99$$

$$99 \div 6 = 16.5$$

The mean score is 16.5

(b) Describe the mistake Graham made in his method to work out the mean score.

Graham should have done $99 \div 30 = 3.3$
 He divided by the number of groups instead.

(1)

(Total for question = 2 marks)

Q6. CALCULATOR ALLOWED

$n = 80$

The table shows information about the heights of 80 plants.

Height (h cm)	Frequency
$10 < h \leq 20$	7
$20 < h \leq 30$	13
$30 < h \leq 40$	14
$40 < h \leq 50$	12
$50 < h \leq 60$	16
$60 < h \leq 70$	18

(a) Find the class interval that contains the median.

category containing middle value

$$\begin{aligned} \text{Middle position} &= \frac{n+1}{2} \\ &= \frac{80+1}{2} \\ &= 40.5^{\text{th}} \text{ value} \end{aligned}$$

← 40.5th value is in this group

$$40 < h \leq 50$$

(Total for question = 1 mark)

Q7. CALCULATOR ALLOWED

The table gives information about the times taken, in seconds, by 18 students to run a race.

Time (t seconds)	Frequency	Midpoint	$f \times \text{M.P.}$
$5 < t \leq 10$	1	7.5	7.5
$10 < t \leq 15$	2	12.5	25
$15 < t \leq 20$	7	17.5	122.5
$20 < t \leq 25$	8	22.5	180

Use the midpoint of each category

TOTAL: 335

Work out an estimate for the mean time.
 Give your answer correct to 3 significant figures.

$$\text{Mean} = \frac{335}{18} \quad (3 \text{ sf})$$

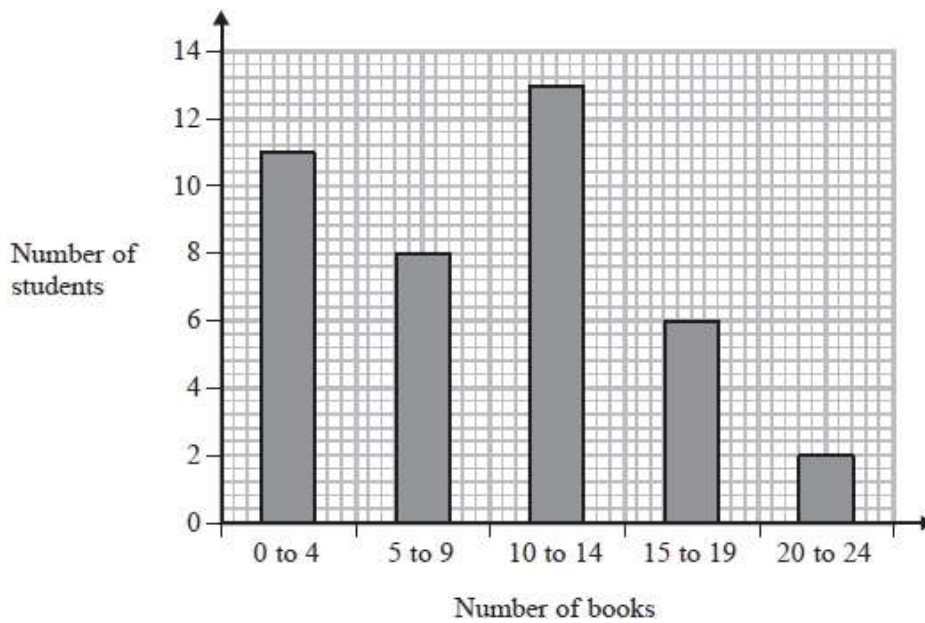
18.6 seconds

(Total for question = 3 marks)

Q8. CALCULATOR ALLOWED

Fran asks each of 40 students how many books they bought last year.

The chart below shows information about the number of books bought by each of the 40 students.



Show that an estimate for the mean number of books bought is 9.5

You must show all your working.

Number of books	Frequency	Midpoint	Freq × Midpoint
0 to 4	11	2	= 22
5 to 9	8	7	= 56
10 to 14	13	12	= 156
15 to 19	6	17	= 102
20 to 24	2	22	= 44
TOTAL:	40	TOTAL:	380

(Total for question = 4 marks)

$$\begin{aligned} \text{Mean} &= \frac{380}{40} \\ &= 9.5 \end{aligned}$$