1. Joshua rolls an ordinary dice once.
It has faces marked 1, 2, 3, 4, 5 and 6.

(a) Write down the probability that he gets

(i) a 6,

....

(ii) an odd number,

....

(iii) a number less than 3,

....

(iv) an 8.

....

(4)

Ken rolls a different dice 60 times. This dice also has six faces.

The table gives information about Ken's scores.

Score on dice	**Frequency**
1	9
2	11
3	20
4	2
5	8
6	10

(b) Explain what you think is different about Ken's dice.

....

(1)
(Total 5 marks)

2. Charles found out the length of reign of each of 41 kings.
He used the information to complete the frequency table.

Length of reign (L years)	Number of kings		
$0 < L \leq 10$	14		
$10 < L \leq 20$	13		
$20 < L \leq 30$	8		
$30 < L \leq 40$	4		
$40 < L \leq 50$	2		

(a) Write down the class interval that contains the median.

…..……………………….

(2)

(b) Calculate an estimate for the mean length of reign.

…………………. years

(4)

(Total 6 marks)

3. Fred did a survey of the time, in seconds, people spent in a queue at a supermarket. Information about the times is shown in the table.

Time (t seconds)	Frequency
$0 < t \leq 40$	8
$40 < t \leq 80$	12
$80 < t \leq 120$	14
$120 < t \leq 160$	16
$160 < t \leq 200$	10

(a) Write down the modal class interval.

………………………seconds

(1)

A person is selected at random from the people in Fred's survey.

(b) Work out an estimate for the probability that the person selected spent more than 120 seconds in the queue.

………………………

(2)

(Total 3 marks)

4. Fred did a survey of the time, in seconds, people spent in a queue at a supermarket. Information about the times is shown in the table.

Time(t seconds)	Frequency
$0 < t \leq 40$	8
$40 < t \leq 80$	12
$80 < t \leq 120$	14
$120 < t \leq 160$	16
$160 < t \leq 200$	10

A person is selected at random from the people in Fred's survey.

Work out an estimate for the probability that the person selected spent more than 120 seconds in the queue.

....

(Total 2 marks)

01. (a) (i) $\frac{1}{6}$ 4

B1 accept equivalent fractions, decimals, or percentages
Accept 0.16 or better, 16 % or better

(ii) $\frac{1}{2}$

B1 accept equivalent fractions, decimals or percentages

(iii) $\frac{1}{3}$

B1 accept equivalent fractions, decimals or percentages
Accept 0.33 or better, 33% or better

(iv) 0

B1 accept 0/6, zero, nought

(b) Ken's dice is biased 1

B1 for dice is biased, unfair, weighted oe

[5]

02. (a) $10 < L \leq 20$ — 2

M1 for use of cumulative frequency to find the 20.5th or 21st value
A1 cao for the correct range – any form

(b) 16.95 — 4

(5 × 14) + (15 × 13) + (25 × 8) + (35 × 4) +
(45 × 2) = 70 + 195 + 200 + 140 + 90 = 695
695 ÷ 41 =

M1 ∑fx using values within intervals (including ends), at least 4 consistently
M1 (dep) ∑fx using midpoints
M1 (dep on 1st M1) "695" ÷ 41
A1 for 16.95 – 17 years or 17.45 – 17.5 years

[6]

03. (a) $120 < t \leq 160$ — 1

B1 correct interval eg 120–160

(b) $\frac{26}{60}$ — 2

M1 (16 + 10) ÷ '60' or 26 seen or $\frac{16}{60}$
A1 oe

[3]

04. $\frac{26}{60}$ — 2

M1 (16 + 10) ÷'60' or 26 seen or $\frac{16}{60}$
A1 oe

[2]

01. Candidates clearly understood the concept of dice rolling and the probability of scoring different combinations of numbers. 57% of candidates could cope with $\frac{1}{6}$, 60% could cope with an odd number, but only 49% could cope with less than 3, whilst a probability of 0 was coped with by 65% of candidates. When it came to explaining a skewed set of data caused by a biased dice only 8% scored the mark for weighted or biased. There were still many candidates who fail to write probability correctly as a decimal, fraction or a percentage. These candidates still use '3 out of 6', '3 in 6', 3:6 etc.

02. **Paper 4**

Candidates rarely showed a correct understanding of how to work towards the median. Common misconceptions included 20.5 as *the* median, or 8 being the median as it is the middle number of the frequencies. Only a minority of candidates arrived at the correct answer. Part (b) is usually well answered, but in this paper there were few correct answers; indeed, most candidates appeared to know little about even using midpoints in their calculations. Of those who did use $f \times x$, a common error was to divide their sum by 5. It was discouraging to see tables completed correctly, but this work then being abandoned and replaced by simple, but incorrect statements such as $41 \div 5 = 8.2$

Paper 6

Another standard question, this time on data handling. A few candidates calculated the wrong median by finding $42 \div 2 = 21$ and then writing down the interval 20 – 30
The mean was generally found correctly, although there were a few who found the sum of the frequencies and divided by 5. Candidates could assume the midpoints were, for example, at 5 or 5.5 for full marks as age can be treated as a discrete variable.

03. **Specification A**

Surprisingly only about 1/3 of candidates answered part (a) correctly. Many demonstrated their confusion with the median (or mean) by choosing the interval from 80. Some chose the correct interval but then spoilt their answer by giving the midpoint or the frequency as their answer. Part (b) was well answered. Most used fractions and there were few cases of incorrect notation. The most common errors included incorrect totalling of the frequencies, picking out the 16 only (to give $\frac{16}{60}$) or stating the 26, but not as a probability.

Specification B

Part (a) was not answered well, many candidates showing a clear misunderstanding of the requirements of the question, often giving values 120, 140 or 160 only as their answer. In part (b) most candidates gained at least 1 mark and usually 2. Common wrong answers were $\frac{16}{60}$ or $\frac{26}{50}$; these gained one mark only.

04. This question was done well by many candidates. Most appreciated the need to add the frequencies for both intervals to gain at least one mark for 26. The most common incorrect answers were $\frac{16}{60}$ and $\frac{26}{50}$; and, less commonly, $\frac{1}{26}$, $\frac{34}{60}$, and $\frac{16}{60} \times \frac{26}{50}$.