

(Total 7 marks)



Question 2 continued

(Total 8 marks)

Q2



Q3

- (b) Find the value of d such that $P(L < d) = 0.10$

Given that it is 127 hours since Alice last charged her phone,

- (c) find the probability that her phone will not need charging before her journey is completed.
- (4)**

Question 4 continued

Q4

(Total 10 marks)



5. A survey of 100 households gave the following results for weekly income £ y .

Income y (£)	Mid-point	Frequency f
$0 \leq y < 200$	100	12
$200 \leq y < 240$	220	28
$240 \leq y < 320$	280	22
$320 \leq y < 400$	360	18
$400 \leq y < 600$	500	12
$600 \leq y < 800$	700	8

(You may use $\sum fy^2 = 12\,452\,800$)

A histogram was drawn and the class $200 \leq y < 240$ was represented by a rectangle of width 2 cm and height 7 cm.

- (a) Calculate the width and the height of the rectangle representing the class $320 \leq y < 400$ (3)

- (b) Use linear interpolation to estimate the median weekly income to the nearest pound. (2)

- (c) Estimate the mean and the standard deviation of the weekly income for these data. (4)

One measure of skewness is $\frac{3(\text{mean} - \text{median})}{\text{standard deviation}}$.

- (d) Use this measure to calculate the skewness for these data and describe its value. (2)

Katie suggests using the random variable X which has a normal distribution with mean 320 and standard deviation 150 to model the weekly income for these data.

- (e) Find $P(240 < X < 400)$. (2)

- (f) With reference to your calculations in parts (d) and (e) and the data in the table, comment on Katie's suggestion. (2)



Q5

6. A fair blue die has faces numbered 1, 1, 3, 3, 5 and 5. The random variable B represents the score when the blue die is rolled.

(a) Write down the probability distribution for B . (2)

(b) State the name of this probability distribution. (1)

(c) Write down the value of $E(B)$. (1)

A second die is red and the random variable R represents the score when the red die is rolled.

The probability distribution of R is

r	2	4	6
$P(R = r)$	$\frac{2}{3}$	$\frac{1}{6}$	$\frac{1}{6}$

(d) Find $E(R)$. (2)

(e) Find $\text{Var}(R)$. (3)

Tom invites Avisha to play a game with these dice.

Tom spins a fair coin with one side labelled 2 and the other side labelled 5. When Avisha sees the number showing on the coin she then chooses one of the dice and rolls it. If the number showing on the die is greater than the number showing on the coin, Avisha wins, otherwise Tom wins.

Avisha chooses the die which gives her the best chance of winning each time Tom spins the coin.

(f) Find the probability that Avisha wins the game, stating clearly which die she should use in each case. (4)







(Total 13 marks)

Q6





Question 7 continued

(Total 12 marks)

Q7

TOTAL FOR PAPER: 75 MARKS

END

