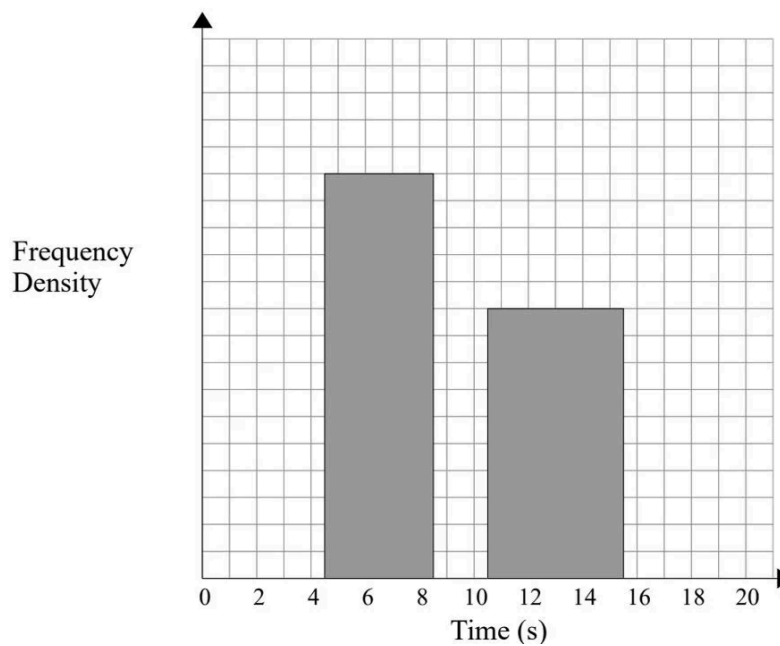


- 1 The partially completed histogram and the partially completed table show the times taken, to the nearest second, for a group of people to complete a puzzle.



Time (seconds)	Frequency
1 – 4	2
5 – 8	12
9 – 10	8
11 – 15	
16 – 20	3

- (a) Complete the table.

(2)

(b) Complete the histogram

(2)

(c) One of the participants is selected at random. Estimate the probability that this participant completed the puzzle in under 10 seconds.

(2)

(Total for question 1 is 6 marks)

- 2** A variable x was measured to the nearest whole number. 50 observations are given in the table below.

x	5 – 8	9 – 13	14 – 20	21 – 24
Frequency	10	9	14	17

A histogram was drawn and the bar representing the 9 – 13 class has a width of 2 cm and a height of 2.7 cm.

Find the width and height of the bar representing the 14 – 20 class.

(Total for question 2 is 3 marks)

- 3** A variable y was measured to the nearest whole number. 40 observations are given in the table below.

y	10 – 19	20 – 24	25 – 28	29 – 30
Frequency	13	7	15	5

A histogram was drawn and the bar representing the 10 – 19 class has a width of 2.5 cm and a height of 2.6 cm.

- (a) Find the width and height of the bar representing the 20 – 24 class.

(3)

- (b) Find the width and height of the bar representing the 25 – 28 class.

(3)

(Total for question 3 is 6 marks)

- 4 The distance travelled by 100 people to an event is summarised below.

Distance (nearest mile)	Frequency
0 – 9	4
10 – 14	19
15 – 18	41
19 – 20	26
21 – 25	9

A histogram was drawn and the bar representing the 10 – 14 class has a width of 3 cm and a height of 1.9 cm.

- (a) Find the width and height of the bar representing the 15 – 18 class.

(3)

- (b) Find the width and height of the bar representing the 19 – 20 class.

(3)

(Total for question 4 is 6 marks)

- 5** In a study of how students use their mobile telephones, the phone usage of a random sample of 11 students was examined for a particular week. The total length of calls, y minutes, for the 11 students were:

17, 23, 35, 36, 51, 53, 54, 55, 60, 77, 110

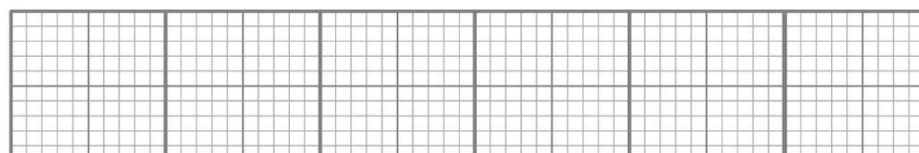
- (a) Find the median and quartiles for these data.

(3)

- (b) A value that is greater than $Q_3 + 1.5 \times (Q_3 - Q_1)$ or smaller than $Q_1 - 1.5 \times (Q_3 - Q_1)$ is defined as an outlier. Show that 110 is the only outlier.

(3)

- (c) Draw a box plot for these data indicating clearly the position of the outlier.



(3)

(Total for question 5 is 9 marks)

- 6** In a study of how much time students spend on social media, usage of a random sample of 15 students was examined for a particular day. The total time of usage, x minutes, for the 15 students were:

6, 25, 39, 62, 65, 74, 80, 94, 125, 127, 154, 159, 184, 210, 251

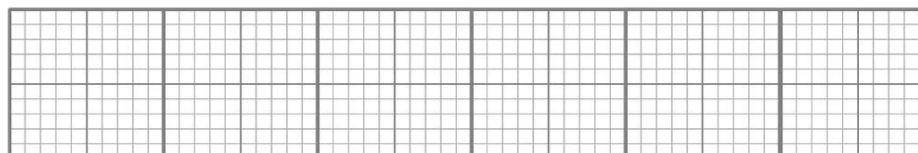
- (a) Find the median and quartiles for these data.

(3)

- (b) A value that is greater than $Q_3 + 1.5 \times (Q_3 - Q_1)$ or smaller than $Q_1 - 1.5 \times (Q_3 - Q_1)$ is defined as an outlier. Show that there are no outliers.

(3)

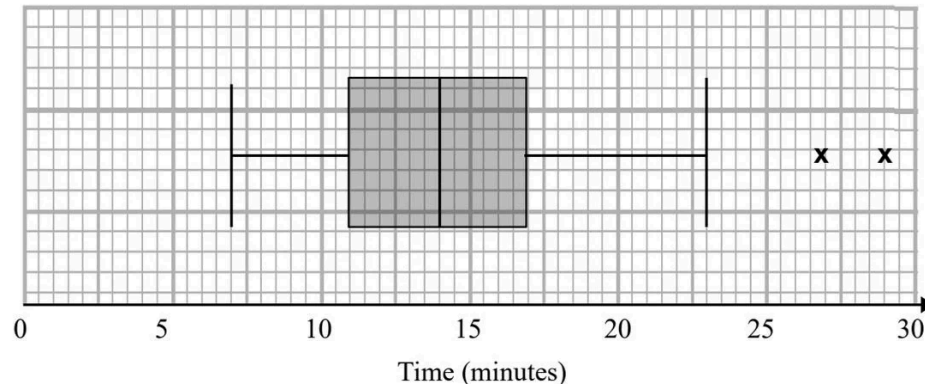
(c) Draw a box plot for these data.



(2)

(Total for question 6 is 8 marks)

- 7 Children from two schools A and B took part in a competition to complete a puzzle. The distribution of times taken, to the nearest minute, by children in school A are shown in the box plot below.



- (a) Write down the time by which 75% of the children in school A had completed the puzzle.

(1)

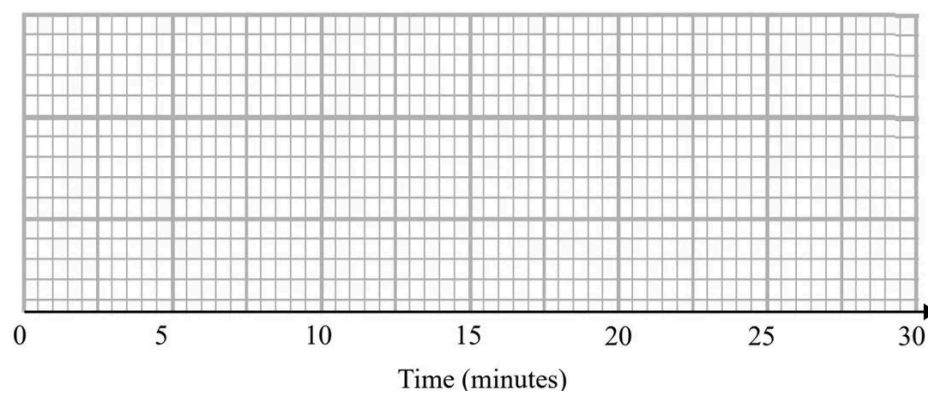
- (b) State what the two crosses (x) represent on the box plot above. Interpret these in context.

(2)

- (c) For school B the shortest time taken was 6 minutes, the longest time taken was 22 minutes and the quartiles were 12, 15 and 17 minutes respectively. A value that is greater than $Q_3 + 1.5 \times (Q_3 - Q_1)$ or smaller than $Q_1 - 1.5 \times (Q_3 - Q_1)$ is defined as an outlier. Determine if there are any outliers.

(4)

(d) Draw a box plot for this information.



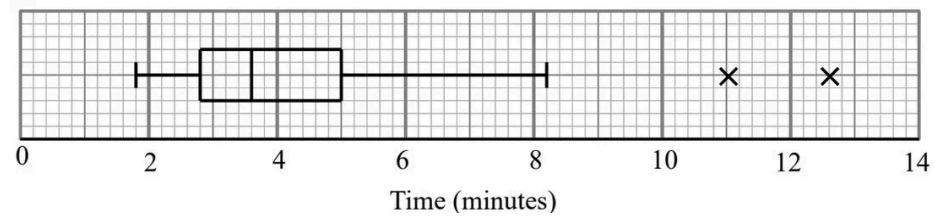
(3)

(e) Compare the two distributions.

(3)

(Total for question 7 is 13 marks)

- 8 100 students completed a puzzle, their times are summarised by summary data and the box plot.



$$\sum x = 405 \quad \sum x^2 = 1984$$

- (a) Write down the range of the times.

(1)

- (b) Write down the interquartile range of the times.

(1)

- (c) Calculate the mean and the standard deviation of the times.

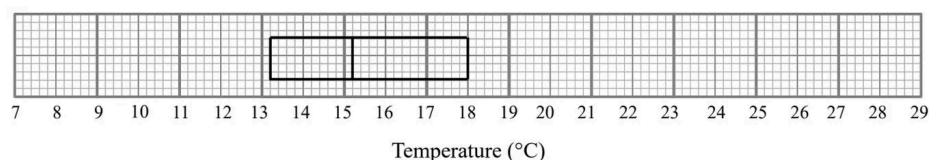
(3)

- (d) State, giving a reason, whether you would recommend using the mean and standard deviation or the median and interquartile range to describe these data.

(2)

(Total for question 8 is 7 marks)

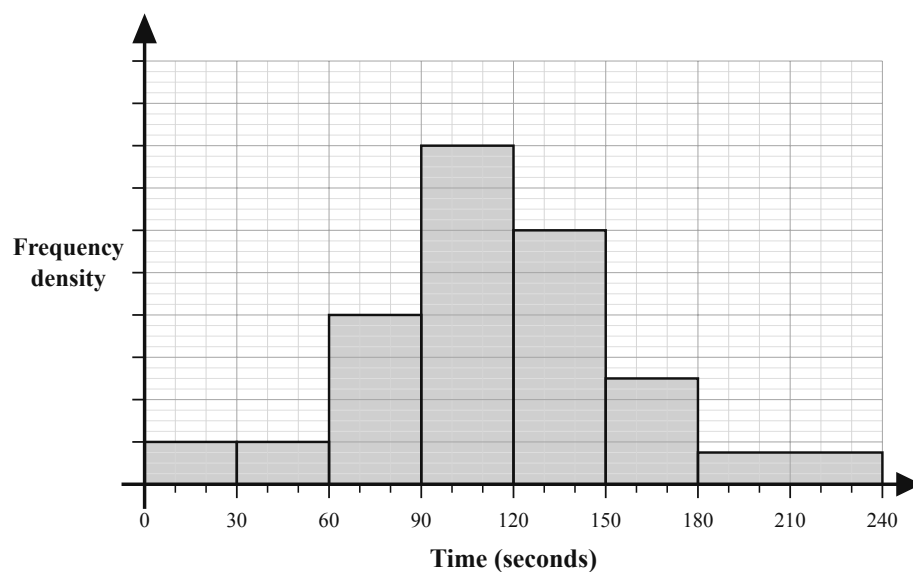
- 9 The partially completed box plot shows the distribution of average temperatures at Heathrow in 2015.



An outlier is defined as a value more than $1.5 \times \text{IQR}$ below Q_1 or more than $1.5 \times \text{IQR}$ above Q_3 . The lowest temperature was 8°C and the highest two temperatures were 23°C and 28.7°C . Complete the box plot showing clearly any outliers.

(Total for question 9 is 4 marks)

- 10 The histogram shows the times taken for a group of people to complete a puzzle.



Time (seconds)	Frequency Density
0 - 30	1
30 - 60	1
60 - 90	4
90 - 120	8
120 - 150	6

The number of people who completed the puzzle in more than 150 minutes is 120.
Estimate the percentage of people who took less than 90 minutes to complete the puzzle.

(Total for question 10 is 4 marks)