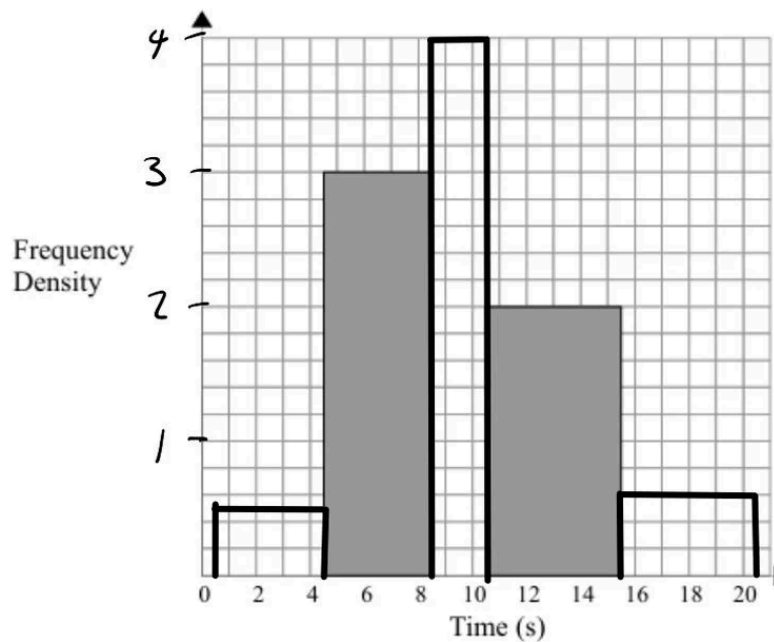


1

- (a)
- Frequency for 11-15 is 10 (B1)
 - Total frequency is 35 (B1)
- (b)
- Calculates Frequency Densities: 0.5, 3, 4, 2, 0.6 (M1)
 - Draws bars for 8-10 (height 4) and 16-20 (height 0.6) (A1)



- (c)
- Sums frequencies for under 10s: $2 + 12 + \frac{3}{4}(8) = 20$ (M1)
 - Final probability: $\frac{20}{35}$ (A1)

(Total for question 1 is 6 marks)

2

- Width scale factor: 5 units = 2 cm $\times \frac{5}{2}$ is incorrect, actual class width 9-13 is 5 units.
5 units = 2 cm $\implies$ 1 unit = 0.4 cm. (M1)
- Width for 14-20 (7 units): $7 \times 0.4 = 2.8$ cm (or $\frac{14}{5}$) (A1)
- Height scale factor: Frequency 9, width 2, height 2.7. Area $\propto$ Freq. $2 \times 2.7 = 5.4$. $k = 9/5.4 = 1.66$.
- Height for 14-20: $14/2.8 = 5$ (density). $5 \times \text{scale factor} = 3$ cm. (A1)

(Total for question 2 is 3 marks)

3

- (a)
- Width: $5 \times \frac{2.5}{10} = 1.25$ cm (or $\frac{5}{4}$) (M1)
 - Height: Frequency density for 20-24 is $7/5 = 1.4$. Scale factor for height is 2. $1.4 \times 2 = 2.8$ cm (or $\frac{14}{5}$) (A2)
- (b)
- Width: $4 \times \frac{1}{4} = 1$ cm (M1)
 - Height: Frequency density $15/4 = 3.75$. $3.75 \times 2 = 7.5$ cm (or $\frac{15}{2}$) (A2)

(Total for question 3 is 6 marks)

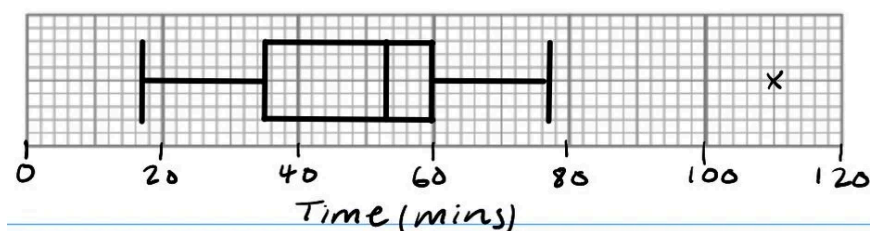
4

- (a)
- Width: $4 \times \frac{3}{5} = 2.4$ cm (or $\frac{12}{5}$) (M1)
 - Height: Frequency density $41/4 = 10.25$. Scale factor 0.5. $10.25 \times 0.5 = 5.125$ cm (or $\frac{41}{8}$) (A2)
- (b)
- Width: $2 \times \frac{3}{5} = 1.2$ cm (or $\frac{6}{5}$) (M1)
 - Height: Frequency density $26/2 = 13$. $13 \times 0.5 = 6.5$ cm (or $\frac{13}{2}$) (A2)

(Total for question 4 is 6 marks)

5

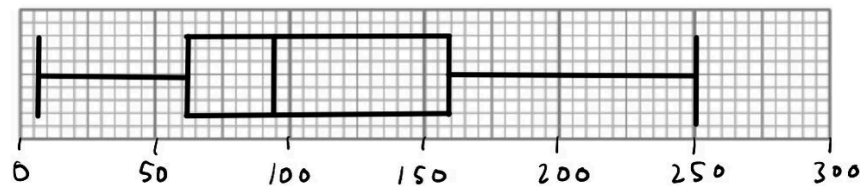
- (a)
- Median: 53 (B1)
 - Q_1 : 35 (B1)
 - Q_3 : 60 (B1)
- (b)
- Upper limit: $60 + 1.5(60 - 35) = 97.5$ (M1)
 - Lower limit: $35 - 1.5(60 - 35) = -2.5$ (M1)
 - Conclusion: $110 > 97.5$, so 110 is an outlier. No other values are outside limits. (A1)
- (c)
- Box with Q_1, M, Q_3 at 35, 53, 60 (B1)
 - Whiskers to 17 and 77 (B1)
 - Outlier marked with 'x' at 110 (B1)



(Total for question 5 is 9 marks)

6

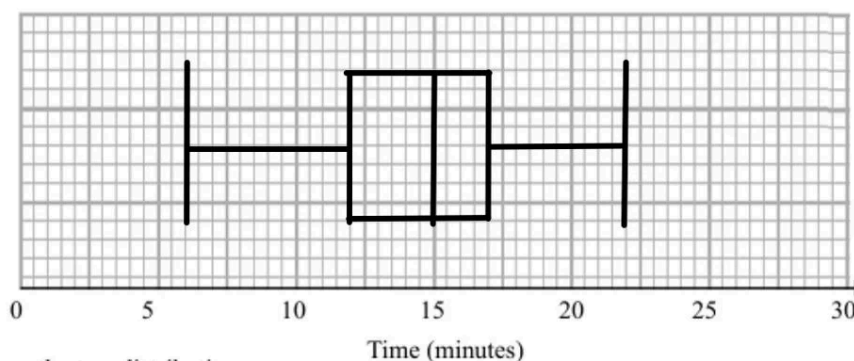
- (a)
- Median: 94 (B1)
 - Q_1 : 62 (B1)
 - Q_3 : 159 (B1)
- (b)
- Upper limit: $159 + 1.5(159 - 62) = 304.5$ (M1)
 - Lower limit: $62 - 1.5(159 - 62) = -83.5$ (M1)
 - Conclusion: All values are within $[-83.5, 304.5]$, so no outliers. (A1)
- (c)
- Box plot with min 6, Q_1 62, Median 94, Q_3 159, max 251. (B2)



(Total for question 6 is 8 marks)

7

- (a) • $Q_3 = 17$ minutes (B1)
- (b) • Outliers. (B1)
• Two children's times (27 and 29 mins) were much greater than the rest. (B1)
- (c) • $IQR = 17 - 12 = 5$ (M1)
• Lower: $12 - 1.5(5) = 4.5$ (M1)
• Upper: $17 + 1.5(5) = 24.5$ (M1)
• Conclusion: No outliers as $6 > 4.5$ and $22 < 24.5$. (A1)
- (d) • Box plot with min 6, Q_1 12, Median 15, Q_3 17, max 22. (B3)



- (e) • Median: School B's median (15) is higher than School A's (14). (B1)
• Spread: School B's IQR (5) is lower than School A's (6), so School B's times are less spread out. (B1)
• Outliers: School A has outliers, School B does not. (B1)

(Total for question 7 is 13 marks)

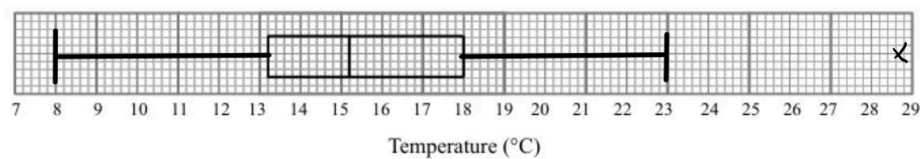
8

- (a) • Range: $12.6 - 1.8 = 10.8$ mins (B1)
- (b) • $IQR : 5 - 2.8 = 2.2$ mins (B1)
- (c) • Mean: $405/100 = 4.05$ (B1)
• Standard Deviation: $\sqrt{\frac{1984}{100} - 4.05^2} = 1.85$ (M1 A1)
- (d) • Median and IQR. (B1)
• Reason: Data is skewed or contains outliers which affect the mean and SD. (B1)

(Total for question 8 is 7 marks)

9

- $IQR = 18 - 13.2 = 4.8$ (M1)
- Upper limit: $18 + 1.5(4.8) = 25.2$ (M1)
- Lower limit: $13.2 - 1.5(4.8) = 6$ (M1)
- Outlier at 28.7 marked with 'x', whisker to 23, whisker to 8. (A1)



(Total for question 9 is 4 marks)

10

- Calculates area/boxes for > 150 mins: 48 boxes (M1)
- Scale: $120/48 = 2.5$ people per box (M1)
- Total frequency: 355 people (A1)
- Frequency < 90 mins: 55 people. Percentage: $\frac{55}{355} \times 100 = 15.5\%$ (A1)

(Total for question 10 is 4 marks)