Solutions

Marking: **M1** a correct method, **A1** the correct answer.

Each answer shows the steps, then the **result**.

2.1

- mean $= \dfrac{4+7+7+9+13}{5} = \dfrac{40}{5} = \mathbf{8}$
- the list is already in order, so the median is the third value, **7**
- mode = **7**, the only repeated value
- range $= 13 - 4 = \mathbf{9}$

2.2

- eight values, so the median is the mean of the 4th and 5th: $\dfrac{8+11}{2} = \mathbf{9.5}$
- $Q_1 = \dfrac{5+8}{2} = 6.5$ and $Q_3 = \dfrac{14+17}{2} = 15.5$

$$\text{IQR} = 15.5 - 6.5 = \mathbf{9}$$

2.3

- total $= 14 \times 6$

$$= \mathbf{84}$$

2.4

- the median is the 4th value, 20; the lower half $12, 15, 18$ gives $Q_1 = 15$ and the upper half $22, 25, 30$ gives $Q_3 = 25$

$$\text{IQR} = 25 - 15 = \mathbf{10}$$

2.5

- on average Team A scores higher: its median, 15, is above 12
- Team A is more consistent: its IQR, 4, is smaller than 9

3.1

(a)

- midpoints 5, 15, 25, 35
- $\sum fx = 4(5) + 11(15) + 9(25) + 6(35) = 20 + 165 + 225 + 210 = 620$
- $\sum f = 30$

$$\frac{620}{30} = 20.67\ldots = \mathbf{20.7} \text{ minutes}$$

(b)

- the class with the highest frequency, 11

$$\mathbf{10 < t \leqslant 20}$$

- all four classes have the same width here, so the highest frequency is also the highest frequency density

(c)

- the individual times inside each class are not known; the midpoint assumes they are spread evenly through the class

3.2

- the first five total $12 \times 5 = 60$
- all six total $13 \times 6 = 78$

$$78 - 60 = \mathbf{18}$$

3.3

- boys' total $= 20 \times 60 = 1200$; girls' total $= 30 \times 66 = 1980$
- overall total $= 1200 + 1980 = 3180$

$$\text{mean} = \frac{3180}{50} = \mathbf{63.6}$$

3.4

(a)

- total $= 4 \times 7.5 = 30$, and $x + (x+4) + 2x + (3x-2) = 7x + 2$, so $7x + 2 = 30$

$$x = \mathbf{4}$$

(b)

- the numbers are $4, 8, 8, 10$: median $= \dfrac{8+8}{2} = \mathbf{8}$
- range $= 10 - 4 = \mathbf{6}$

3.5

- the mode is 5, so two of the numbers are 5; in order $5, 5, c, d$
- median $= \dfrac{5+c}{2} = 6$, so $c = 7$
- total $= 4 \times 7 = 28$, so $d = 28 - 5 - 5 - 7 = 11$: the numbers are **5**, **5**, **7**, **11**

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