Interquartile range and box plots

6 questions | 14 marks

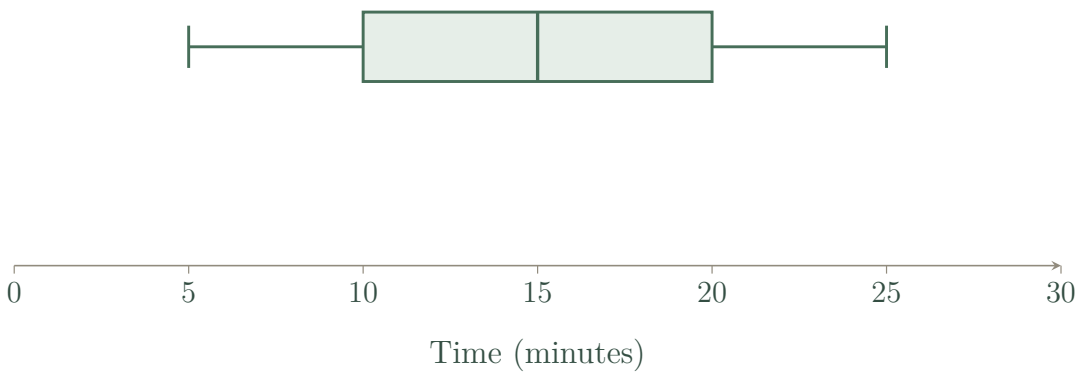
Equivalent correct methods earn the corresponding marks.

1. Calculate IQR when $Q_1 = 7.5$ cm and $Q_3 = 12.0$ cm. [2 marks]

$12.0 - 7.5 = 4.5$.

Answer: 4.5 cm

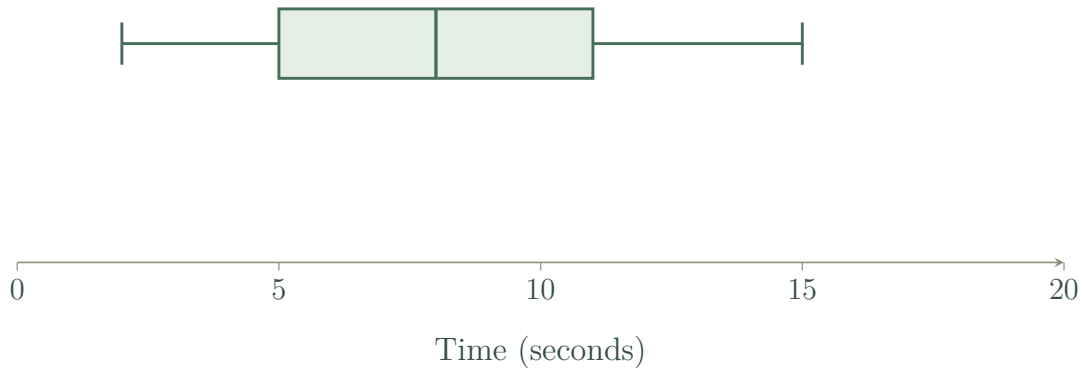
2. State the five-number summary shown. [2 marks]



Read the two whisker ends, the box ends and the median line in order.

Answer: 5, 10, 15, 20, 25 minutes

3. Draw a labelled box plot for the summary 2, 5, 8, 11, 15 seconds. [3 marks]



Choose a consistent scale covering 2 to 15.

Mark all five summary values; join the box and whiskers.

Answer: Whiskers at 2 and 15; box from 5 to 11; median at 8, on a seconds scale.

4. A: median 20, IQR 6. B: median 24, IQR 4. Compare the typical mass and central spread. [3 marks]

$24 > 20$ compares medians.

$4 < 6$ compares IQRs.

Answer: B has higher median mass and smaller central spread.

5. Can a box plot alone tell you the exact mean? Explain. [2 marks]

A box plot supplies five positions, not every observation.

Different data sets with that summary may have different means.

Answer: No.

6. Two plots use horizontal scales 0-20 and 0-100. Why should you redraw them before comparing box widths? [2 marks]

A centimetre on the page represents different amounts.

Use a common numerical scale for a fair visual comparison.

Answer: The different scales distort apparent spread.