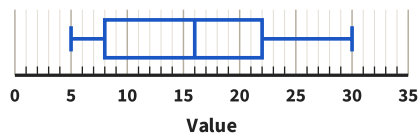


Box Plots *extend*

ANSWERS

1

Seven numbers in order are $5, n, 11, 2n, 17, 3n - 2, 30$.
The interquartile range is 14. Find n , then draw the box plot.



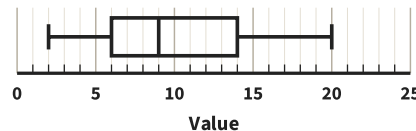
$$(3n - 2) - n = 2n - 2 = 14$$

Box plot: 5, 8, 16, 22, 30

Answer $n = 8$

2

Seven whole numbers have this box plot. Their mean is 10. The two numbers the box plot does not show differ by 3. Find all seven numbers.



$$7 \times 10 = 70; \text{hidden two: } 70 - 51 = 19$$

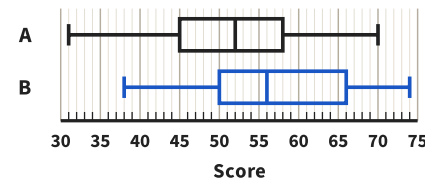
$$8 + 11 = 19 \text{ and } 11 - 8 = 3$$

Answer 2, 6, 8, 9, 11, 14, 20

3

The box plot shows class A's test scores. Draw a box plot for class B's 15 scores. Which class did better? Compare them.

56, 41, 66, 50, 74, 38, 60, 53, 69, 47, 63, 55, 71, 52, 65



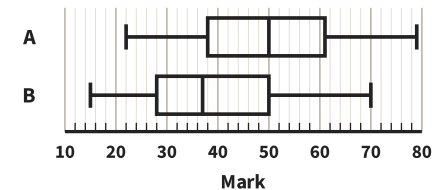
$$B: 38, 50, 56, 66, 74$$

Medians A 52, B 50; IQRs A 13, B 15

Answer B: higher median ($56 > 52$)

4

Group A has 40 students and group B has 60. The box plots show their marks. Estimate what percentage of all 100 students scored more than 50 marks.



$$A: \text{half of } 40 = 20 \text{ (A's median 50)}$$

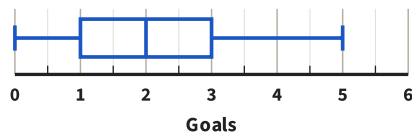
$$B: \text{a quarter of } 60 = 15 \text{ (B's UQ 50)}$$

Answer 35 out of 100 = 35%

5

The table shows how many goals a hockey team scored in each of its 23 matches. Draw a box plot.

Goals	0	1	2	3	4	5
Matches	4	6	5	4	3	1



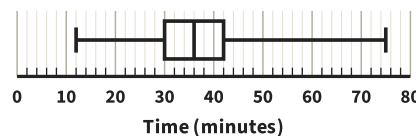
$$LQ \text{ 6th, median 12th, UQ 18th value}$$

Running totals 4, 10, 15, 19, 22, 23

Box plot 0, 1, 2, 3, 5

6

An outlier is a value more than $1.5 \times \text{IQR}$ above the upper quartile or below the lower quartile. The box plot shows a shop's delivery times. Is the longest time an outlier? Is the shortest?



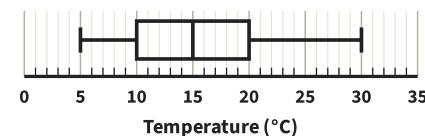
$$1.5 \times 12 = 18; 42 + 18 = 60, 30 - 18 = 12$$

$$75 > 60, \text{ but } 12 \text{ is not less than } 12$$

Answer 75 is; 12 is not

7

The box plot shows noon temperatures in $^{\circ}\text{C}$ on 31 days. $F = 1.8C + 32$ changes $^{\circ}\text{C}$ to $^{\circ}\text{F}$. Find the median and the IQR in $^{\circ}\text{F}$. Why is the IQR not $1.8 \times 10 + 32$?



$$1.8 \times 15 + 32 = 59; \text{UQ } 68, \text{LQ } 50$$

$$68 - 50 = 18; \text{the } + 32\text{s cancel}$$

Answer 59 $^{\circ}\text{F}$ and 18 $^{\circ}\text{F}$

8

Seven different whole numbers have a range of 10. Prove that their interquartile range is at least 4 and at most 8.

$$LQ \text{ is the 2nd value, UQ the 6th}$$

$$\text{All different: } 6\text{th} \geq 2\text{nd} + 4, \text{ so } IQR \geq 4$$

$$2\text{nd} \geq \text{lowest} + 1, 6\text{th} \leq \text{highest} - 1$$

$$\text{so } IQR \leq 10 - 2 = 8$$

Proof $4 \leq IQR \leq 8$