LESSON MAKER PRO

Boxplot Detectives

Read the five key values and measure spread.

GRADE 8 · 8.PS.2.e

8.PS.2.e "Identify and describe the lower extreme (minimum), upper extreme (maximum), median, upper quartile, lower quartile, range, and interquartile range given a data set, represented by a boxplot."

NAME _____ DATE _____

FIVE NUMBERS, TWO SPREADS

On a boxplot, read from left to right: minimum, lower quartile (Q1), median, upper quartile (Q3), and maximum. Find the range by subtracting minimum from maximum, and find the interquartile range (IQR) by subtracting Q1 from Q3.

WORKED EXAMPLE

A boxplot has these five values: minimum 12, Q1 17, median 21, Q3 28, and maximum 35. Identify the five values, the range, and the IQR.

1. The minimum is 12, Q1 is 17, the median is 21, Q3 is 28, and the maximum is 35.
2. Range = maximum - minimum.
3. Range = 35 - 12 = 23.
4. IQR = Q3 - Q1 = 28 - 17 = 11.

Answer: Minimum 12, Q1 17, median 21, Q3 28, maximum 35, range 23, IQR 11.

PRACTICE 6 problems

1 A boxplot has minimum 4, Q1 9, median 14, Q3 19, and maximum 25. What are the lower extreme and upper extreme?

ANSWER _____

2 A boxplot has minimum 6, Q1 10, median 13, Q3 18, and maximum 24. What are the median and IQR?

ANSWER _____

3 A boxplot has minimum 30, Q1 34, median 39, Q3 43, and maximum 48. What is the range?

ANSWER _____

4 A boxplot has minimum 2, Q1 7, median 11, Q3 16, and maximum 20. What is the lower quartile?

ANSWER _____

5 A boxplot has Q1 15 and Q3 27. What is the IQR?

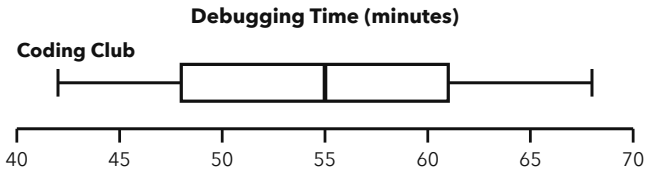
ANSWER _____

6 A boxplot has minimum 41, Q1 45, median 50, Q3 56, and maximum 63. What are the median and range?

ANSWER _____

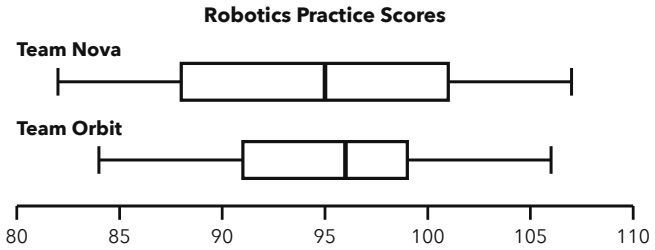
APPLY IT Show your work

1 Students in a coding club recorded how many minutes they spent debugging a program. Use the boxplot to identify the minimum, Q1, median, Q3, and maximum. Then find the range and IQR.



ANSWER _____

2 Two robotics teams tracked their scores during practice rounds. Which team has the greater IQR, and which team has the greater range? Include both IQRs and both ranges.



ANSWER _____

CHALLENGE One step up

A boxplot has a lower extreme of 58, Q1 of 64, a median of 72, Q3 of 83, and an upper extreme of 90. Sam says the IQR is 26 because 90 - 64 = 26. Is Sam correct? Explain which two values are used for IQR, then find the IQR and range.

WORK SPACE AND ANSWER

ANSWER KEY

Boxplot Detectives

GRADE 8 · 8.PS.2.e

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A boxplot has minimum 4, Q1 9, median 14, Q3 19, and maximum 25. What are the lower extreme and upper extreme?	**Lower extreme: 4; upper extreme: 25.**
2	A boxplot has minimum 6, Q1 10, median 13, Q3 18, and maximum 24. What are the median and IQR?	**Median: 13; IQR: 8.**
3	A boxplot has minimum 30, Q1 34, median 39, Q3 43, and maximum 48. What is the range?	**18**
4	A boxplot has minimum 2, Q1 7, median 11, Q3 16, and maximum 20. What is the lower quartile?	**7**
5	A boxplot has Q1 15 and Q3 27. What is the IQR?	**12**
6	A boxplot has minimum 41, Q1 45, median 50, Q3 56, and maximum 63. What are the median and range?	**Median: 50; range: 22.**

PART 2 · APPLY IT

1. **Minimum 42, Q1 48, median 55, Q3 61, maximum 68, range 26, IQR 13.** Read the five labeled locations on the boxplot. Compute 68 - 42 for the range and 61 - 48 for the IQR.
2. **Team Nova has the greater IQR and the greater range. Team Nova: IQR 13, range 25. Team Orbit: IQR 8, range 22.** For each team, subtract Q1 from Q3 to find IQR and subtract minimum from maximum to find range. Compare the two results for each measure.

CHALLENGE

Sam is not correct. The IQR uses Q3 and Q1, so 83 - 64 = 19. The range uses the upper and lower extremes, so 90 - 58 = 32.

Accept Q1 for lower quartile and Q3 for upper quartile. Accept correct subtraction expressions along with the correct values.