

Data Detective Notes

Find the center, spread, and shape of a data set.

GRADE 6 • TEKS 6.12.C

6.12.C "summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread..."

NAME _____

DATE _____

CENTER AND SPREAD

First, put the data in order. The mean is the total divided by the number of values, the median is the middle value, and the range is greatest value minus least value. To find the IQR, find the median of each half of the ordered data, leaving out the overall median when there is one, then subtract Q1 from Q3. Compare the mean and median to help describe whether data are symmetric or skewed.

WORKED EXAMPLE

Find the mean, median, range, and IQR for 4, 7, 9, 10, 13, 15, 18, 20.

1. Add the values: $4 + 7 + 9 + 10 + 13 + 15 + 18 + 20 = 96$.
2. Mean: $96 / 8 = 12$; median: $(10 + 13) / 2 = 11.5$.
3. $Q1 = (7 + 9) / 2 = 8$; $Q3 = (15 + 18) / 2 = 16.5$.
4. Range: $20 - 4 = 16$; IQR: $16.5 - 8 = 8.5$.

Answer: Mean = 12, median = 11.5, range = 16, IQR = 8.5.

PRACTICE 6 problems

- 1** Find the mean, median, and range for 2, 6, 12, 14, 16.

ANSWER _____

- 2** Find Q1, Q3, and the IQR for 1, 5, 8, 11, 17, 19.

ANSWER _____

- 3** Find the mean and median for 21, 22, 23, 24, 25. Is the distribution symmetric, skewed left, or skewed right?

ANSWER _____

- 4** For 26, 27, 28, 29, 46, find the mean and median. Is the mean or median a better measure of center?

ANSWER _____

- 5** Data Set A: 30, 32, 34, 36, 38. Data Set B: 31, 33, 34, 35, 37. Find each set's mean, median, and range. Which set has less spread?

ANSWER _____

- 6** Find Q1, Q3, and the IQR for 50, 52, 54, 56, 58, 60.

ANSWER _____

APPLY IT Show your work

- 1** A student recorded the number of minutes it took to finish seven levels in a game: 61, 63, 65, 67, 69, 71, 73. Find the mean, median, range, and IQR. Describe the shape of the distribution.

WORK SPACE

ANSWER _____

- 2** Two robotics teams recorded their practice scores. Team A scored 80, 82, 84, 86, 88. Team B scored 76, 83, 84, 85, 92. Find the mean, median, range, and IQR for each team. Which team was more consistent?

WORK SPACE

ANSWER _____

CHALLENGE One step up

The numbers of points scored in six games were 101, 103, 104, 105, 107, 130. Find the mean, median, range, and IQR. Then explain why the distribution is skewed right.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Find the mean, median, and range for 2, 6, 12, 14, 16.	Mean = 10, median = 12, range = 14.
2	Find Q1, Q3, and the IQR for 1, 5, 8, 11, 17, 19.	Q1 = 5, Q3 = 17, IQR = 12.
3	Find the mean and median for 21, 22, 23, 24, 25. Is the distribution symmetric, skewed left, or skewed right?	Mean = 23, median = 23, so the distribution is symmetric.
4	For 26, 27, 28, 29, 46, find the mean and median. Is the mean or median a better measure of center?	Mean = 31.2, median = 28. The median is a better measure of center because 46 pulls the mean higher.
5	Data Set A: 30, 32, 34, 36, 38. Data Set B: 31, 33, 34, 35, 37. Find each set's mean, median, and range. Which set has less spread?	Set A: mean = 34, median = 34, range = 8. Set B: mean = 34, median = 34, range = 6. Set B has less spread.
6	Find Q1, Q3, and the IQR for 50, 52, 54, 56, 58, 60.	Q1 = 52, Q3 = 58, IQR = 6.

PART 2 • APPLY IT

- Mean = 67, median = 67, range = 12, IQR = 8. The distribution is symmetric.** The values are already ordered. The mean and median are both 67, and the data are balanced around 67.
- Team A: mean = 84, median = 84, range = 8, IQR = 6. Team B: mean = 84, median = 84, range = 16, IQR = 9. Team A was more consistent.** Both teams have the same center, but Team A has a smaller range and IQR. Its scores are less spread out.

CHALLENGE

Mean = $108 \frac{1}{3}$, median = 104.5, range = 29, IQR = 4. The score of 130 is much higher than the other scores, so it pulls the mean above the median and makes the distribution skewed right.

Use the median-of-halves method shown in the concept box, excluding the overall median for data sets with an odd number of values. Accept $108 \frac{1}{3}$, $325/3$, or 108.333... for the challenge mean.