

Data Distance Detectives

Find the spread and judge data patterns.

GRADE 8 • TEKS 8.11

8.11 "Measurement and data. The student applies mathematical process standards to use statistical procedures to describe data. The student is expected to: construct a scatterplot and describe the observed data to address questions of association..."

NAME _____

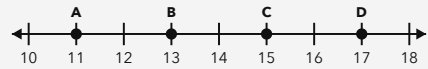
DATE _____

MEAN ABSOLUTE DEVIATION

Mean absolute deviation, or MAD, tells the average distance of data values from the mean. Find the mean, find each distance from the mean, then average those distances.

WORKED EXAMPLE

The number line shows four skaters' wait times, in minutes, for an ice rink. Find the MAD.



1. Find the mean: $(11 + 13 + 15 + 17)/4 = 56/4 = 14$.
2. Find distances: 3, 1, 1, 3.
3. Average distances: $(3 + 1 + 1 + 3)/4 = 2$.

Answer: The MAD is 2 minutes.

PRACTICE 4 problems

- 1** Four robotics teammates took 2, 4, 6, and 8 minutes to test a sensor. Find the MAD of the times.

ANSWER _____

- 2** A gamer earned 1, 1, 9, and 9 bonus points in four rounds. Find the MAD of the bonus points.

ANSWER _____

- 3** A student recorded 0, 4, 8, and 12 pages read on four evenings. Find the MAD.

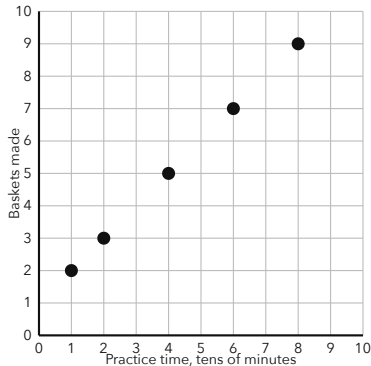
ANSWER _____

- 4** A student says the MAD of 3, 3, 9, and 9 is 2. Is the student correct? Explain with the correct MAD.

ANSWER _____

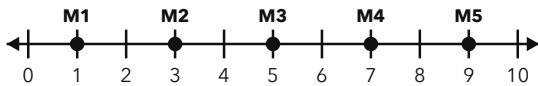
APPLY IT Show your work

- 1** A basketball coach recorded practice time, in tens of minutes, and baskets made out of 10. What association does the scatterplot show? Use both direction and shape.



ANSWER _____

- 2** The number line shows ratings from five members of a music club. Read the points from left to right as members 1 through 5. A random-digit simulation selected members 1, 3, and 5. List the sample ratings, find the sample mean, and compare it with the population mean.



ANSWER _____

CHALLENGE One step up

A teen center has six game ratings: 2, 4, 6, 8, 10, and 12. Two random simulations each selected three ratings. Sample A is 2, 6, 8. Sample B is 4, 6, 10. Which sample is more representative of the population based on mean? Show the population mean and both sample means.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Four robotics teammates took 2, 4, 6, and 8 minutes to test a sensor. Find the MAD of the times.	2 minutes
2	A gamer earned 1, 1, 9, and 9 bonus points in four rounds. Find the MAD of the bonus points.	4 points
3	A student recorded 0, 4, 8, and 12 pages read on four evenings. Find the MAD.	4 pages
4	A student says the MAD of 3, 3, 9, and 9 is 2. Is the student correct? Explain with the correct MAD.	No. The mean is 6, and the MAD is 3.

PART 2 • APPLY IT

1. **A positive linear association.** As practice time increases, baskets made increase in a pattern close to a line.
2. **Sample ratings: 1, 5, 9. Sample mean: 5. Population mean: 5. The sample is representative based on its mean.** Use positions 1, 3, and 5 to select 1, 5, and 9. Both the sample and all five ratings have mean 5.

CHALLENGE

Population mean: 7. Sample A mean: $16/3$, or $5 \frac{1}{3}$. Sample B mean: $20/3$, or $6 \frac{2}{3}$. Sample B is more representative because its mean is closer to 7.

Accept equivalent fraction or mixed-number forms for means. For the scatterplot, accept positive linear relationship or positive linear correlation.