

Distance From Average

Find the mean absolute deviation, or MAD.

GRADE 8 • TEKS 8.11.B

8.11.B "determine the mean absolute deviation and use this quantity as a measure of the average distance data are from the mean using a data set of no more than 10 data points; and"

NAME _____

DATE _____

THE BIG IDEA

First find the mean by adding all the data values and dividing by the number of values. Then find each value's distance from the mean, add those distances, and divide by the number of values. The result is the mean absolute deviation, or MAD.

WORKED EXAMPLE

Find the MAD of 11, 13, 15, 17.

1. Mean: $(11 + 13 + 15 + 17) / 4 = 14$.
2. Distances from 14: 3, 1, 1, 3.
3. Add distances: $3 + 1 + 1 + 3 = 8$.
4. MAD: $8 / 4 = 2$.

Answer: 2

PRACTICE 6 problems

- 1** Find the MAD of 4, 6, 8, 10.

ANSWER _____

- 2** Find the mean and MAD of 2, 4, 6, 8, 10.

ANSWER _____

- 3** A data set has a mean of 4. Its values are 1, 2, 4, 5, 8. Find the MAD.

ANSWER _____

- 4** Find the mean and MAD of $1/2$, 1, $3/2$, 2.

ANSWER _____

- 5** Find the MAD of -4, -2, 0, 2, 4.

ANSWER _____

- 6** Set A: 1, 3, 5, 7. Set B: 2, 3, 4, 5, 6. Which set has less spread as measured by MAD? Find both MADs.

ANSWER _____

APPLY IT Show your work

- 1** The bar graph shows the coins Jordan earned in four rounds of a game. Find the MAD of the coins earned.

COINS EARNED



WORK SPACE

ANSWER _____

- 2** At six soccer practices, Maya completed 8, 10, 12, 14, 16, and 18 successful passes in a drill. Find the MAD of her results.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A six-value data set has a mean of 12. Five of its values are 6, 10, 12, 14, and 18. The sixth value is x . Find x and the MAD of the complete data set.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Find the MAD of 4, 6, 8, 10.	2
2	Find the mean and MAD of 2, 4, 6, 8, 10.	Mean = 6; MAD = 12/5
3	A data set has a mean of 4. Its values are 1, 2, 4, 5, 8. Find the MAD.	2
4	Find the mean and MAD of $1/2$, 1, $3/2$, 2.	Mean = 5/4; MAD = 1/2
5	Find the MAD of -4, -2, 0, 2, 4.	12/5
6	Set A: 1, 3, 5, 7. Set B: 2, 3, 4, 5, 6. Which set has less spread as measured by MAD? Find both MADs.	Set B; MAD of Set A = 2, MAD of Set B = 6/5

PART 2 • APPLY IT

- 4 coins** The mean is 18 coins. The distances from 18 are 6, 2, 2, and 6, so the MAD is $16 / 4 = 4$ coins.
- 3 passes** The mean is 13 passes. The distances from 13 add to 18, and $18 / 6 = 3$ passes.

CHALLENGE

$x = 12$; MAD = 8/3

Accept equivalent fractions and decimals, including 2.4 for $12/5$, 0.5 for $1/2$, and $2\frac{2}{3}$ for $8/3$. Students may list distances in any order as long as each distance is measured from the mean.