

# Mean Absolute Deviation

It's all Greek to me! Greek letters are used a lot in math to represent words and formulas.

$\pi$  (pi) = 3.14  
 $\mu$  (mu) = symbol for the mean  
 $\Sigma$  (uppercase sigma) symbol for Sum  
 $\sigma$  (sigma) symbol for Standard deviation

Mean absolute deviation- Measures the "spread" of the data

The data from the Ch. 8 Geometry test scores are as follows: 89, 97, 90, 98, 60, 77, 77, 100

Step One: Find the mean

$\mu =$  86 \*Sometimes the mean is written like this...  $\sum_{i=1}^n$

Step Two: Figure out the deviation. The deviation is  $x - \mu$ . This means...How far away is a number from the mean.

Test Score	Deviation ( $x - \mu$ )	Absolute Deviation $ x - \mu $
89	3	3
97	11	11
90	4	4
98	12	12
60	-26	26
77	-9	9
77	-9	9
100	14	14
$\mu = 86$	$\mu = 0$	$\mu = 11$

\*The mean of the deviations will always be 0!

Step Three: Some of these values are negative...How can we make them positive?

Find the absolute value.  $|5| = 5$

Find the absolute value for each deviation for each number.  $|-5| = 5$

Step Four: Find the mean of the absolute deviation or the MEAN ABSOLUTE DEVIATION.

Example: Find the mean absolute deviation for the following data: 12, 15, 17, 19, 21, 11

$\mu =$  15.83  
 Mean Absolute Deviation = 3.17

$12 - \mu = -3.83 = 3.83$   
 $15 - \mu = -0.83 = 0.83$   
 $17 - \mu = 1.17$   
 $19 - \mu = 3.17$   
 $21 - \mu = 5.17$   
 $11 - \mu = -4.83 = 4.83$

Try these on your own:

1. Find the mean absolute deviation for the following data: 3, 4, 5, 6, 7, 8, 9, 10

$\mu = \underline{6.5}$   
 Mean Absolute Deviation = 2

$$\begin{array}{l} 3 - \mu = -3.5 = 3.5 \\ 4 - \mu = -2.5 = 2.5 \\ 5 - \mu = -1.5 = 1.5 \\ 6 - \mu = -0.5 = 0.5 \\ 7 - \mu = 0.5 \\ 8 - \mu = 1.5 \\ 9 - \mu = 2.5 \\ 10 - \mu = 3.5 \end{array}$$

2. Find the mean absolute deviation for the following data: 100, 200, 300, 400, 500, 600

$\mu = \underline{350}$   
 Mean Absolute Deviation = 150

$$\begin{array}{l} 100 - 350 = -250 = 250 \\ 200 - 350 = -150 = 150 \\ 300 - 350 = -50 = 50 \\ 400 - 350 = 50 \\ 500 - 350 = 150 \\ 600 - 350 = 250 \end{array}$$

3. Find the mean absolute deviation for the following data: 91, 91, 92, 93, 94, 95, 96, 97, 98

$\mu = \underline{94.11}$   
 Mean Absolute Deviation = 2.12

$$\begin{array}{l} 91 - \mu = -3.11 = 3.11 \\ 91 - \mu = -3.11 = 3.11 \\ 92 - \mu = -2.11 = 2.11 \\ 93 - \mu = -1.11 = 1.11 \\ 94 - \mu = -0.11 = 0.11 \\ 95 - \mu = 0.89 \\ 96 - \mu = 1.89 \\ 97 - \mu = 2.89 \\ 98 - \mu = 3.89 \end{array}$$

4. Find the mean absolute deviation for the following data: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

$\mu = \underline{7.5}$   
 Mean Absolute Deviation = 4

$$\begin{array}{l} 0 - \mu = -7.5 \\ 1 - \mu = -6.5 \\ 2 - \mu = -5.5 \\ 3 - \mu = -4.5 \\ 4 - \mu = -3.5 \\ 5 - \mu = -2.5 \\ 6 - \mu = -1.5 \\ 7 - \mu = -0.5 \\ 8 - \mu = 0.5 \\ 9 - \mu = 1.5 \\ 10 - \mu = 2.5 \\ 11 - \mu = 3.5 \\ 12 - \mu = 4.5 \\ 13 - \mu = 5.5 \\ 14 - \mu = 6.5 \\ 15 - \mu = 7.5 \end{array}$$

5. Find the mean absolute deviation for the following data: 7543, 6920, 3931, 8763, 9532

$\mu = \underline{7337.8}$   
 Mean Absolute Deviation = 1529.84

$$\begin{array}{l} 7543 - \mu = 205.2 \\ 6920 - \mu = -417.8 \\ 3931 - \mu = -3406.8 \\ 8763 - \mu = 1425.2 \\ 9532 - \mu = 2194.2 \end{array}$$