

Mean Absolute Deviation

A **mean absolute deviation** is an average of how much data values differ from the mean.

Finding the Mean Absolute Deviation (MAD)

Step 1 Find the mean of the data.

Step 2 Find the distance between each data value and the mean.

Step 3 Find the sum of the distances in Step 2.

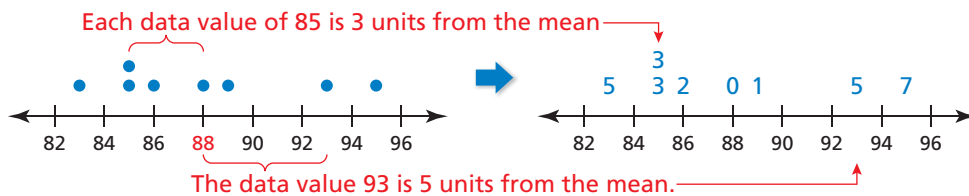
Step 4 Divide the sum in Step 3 by the total number of data values.

Example 1 The scores on a science test are shown below. Find and interpret the mean absolute deviation of the data.

86, 93, 88, 85, 89, 95, 85, 83

Step 1 Mean = $\frac{86 + 93 + 88 + 85 + 89 + 95 + 85 + 83}{8} = \frac{704}{8} = 88$

Step 2 You can use a dot plot to organize the data. Replace each dot with its distance from the mean.



Step 3 The sum of the distances is $5 + 3 + 3 + 2 + 0 + 1 + 5 + 7 = 26$.

Step 4 The mean absolute deviation is $\frac{26}{8} = 3.25$.

► So, the data values differ from the mean by an average of 3.25 points.

Practice

Check your answers at BigIdeasMath.com.

Find and interpret the mean absolute deviation of the data.

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| <p>1. 9, 10, 11, 11, 12, 12, 13, 13, 14, 15
1.4; The data values differ from the mean by an average of 1.4.</p> <p>3. 24, 26, 27, 27, 28, 28, 30, 32
1.75; The data values differ from the mean by an average of 1.75.</p> | <p>2. 2, 4, 4, 5, 6, 7, 7, 7
1.5; The data values differ from the mean by an average of 1.5.</p> <p>4. 8, 28, 29, 31, 32, 35, 38, 41, 43, 44
7.3; The data values differ from the mean by an average of 7.3.</p> |
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- 5. TEMPERATURES** The table shows the high temperatures for several July days in a city. Find and interpret the mean absolute deviation of the data.
2.4; The data values differ from the mean by an average of 2.4°F.

Temperatures (°F)				
85	79	82	80	90
79	83	83	78	78
80	82	82	86	83