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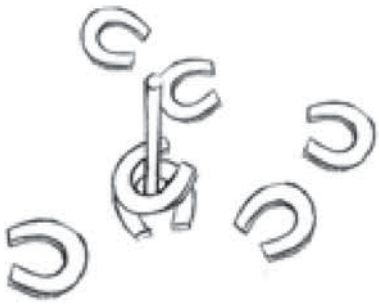
Measures of Variability



Variability describes how clustered or spread out data is. You might think of variability in terms of a game of horseshoes. The goal of the game is to get as many horseshoes as you can to "ring," or hook around, a post. Once a player has taken a turn, the horseshoes—or data—look something like this picture.

One way of measuring variability of data is by finding the *mean absolute deviation*.

Step 1. Find the mean of the data. To do this, you add the data values and divide by the number of values in the set. Suppose you have 20, 40, 60, 80, 100 as the data. The sum of these numbers $20 + 40 + 60 + 80 + 100 = 300$. Since there are 5 items in the set, $300 \div 5 = 60$.

Step 2. Find the absolute deviation for each value in the data set. To do this, find each absolute value of the difference between the mean and each number in the set. So, for the numbers in the set, you get:

$|60 - 20| = \mathbf{40}$

$|60 - 40| = \mathbf{20}$

$|60 - 60| = \mathbf{0}$

$|80 - 60| = \mathbf{20}$

$|100 - 60| = \mathbf{40}$

Step 3. Find the mean of the absolute deviations. You find the mean of the absolute deviations by adding $40 + 20 + 0 + 20 + 40 = 120$. Then divide by the number of values, 5, which gives you 24. So the mean absolute deviation for 20, 40, 60, 80, 100 is 24.

Use the 3-step process to find the mean absolute deviation for each set of data. Give the mean of the original set, the sum of the absolute deviations, and the mean absolute deviation.

1. 10, 15, 20, 30, 50

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2. 500; 1,000; 1,500; 2,000

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