**Guided Notes: 1.3 (Day 2) Describing Quantitative Data with Numbers**

**Measuring Spread: The Standard Deviation**

The most common measure of spread looks at how far each observation is from the mean. This measure is called the **standard deviation.**

Consider the following data on the number of pets owned by a group of 9 children.



1. Calculate the mean.
2. Calculate each deviation. Deviation = observation – mean
3. Square each deviation.
4. Find the “average” squared deviation.

Calculate the sum of the squared deviations divided by (n – 1)….this is called the **variance**.

1. Calculate the square root of the variance…this is the **standard deviation**.

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| **xi** | **(xi-mean)** | **(xi-mean)2** |
| 1 | 1 - 5 = -4 | (-4)2 = 16 |
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|  | **Sum =** | **Sum =** |

The **standard deviation** *sx* measures the average distance of the observations from their mean. It is calculated by finding an average of the squared distances and then taking the square root. This average squared distance is called the **variance**.

 \*\*\*This formula is on the AP Exam

**AP STAT- HW #3**

1. Use the following data: {5, 7, 8, 10, 12, 15, 17, 20, 30, 31, 22, 25, 28, 33, 34, 35, 39, 40}
2. Find the Mean, Median, Range, IQR, and Standard deviation.
3. Create a boxplot of the data
4. Suppose we add the data point 62 to this set of data. Indicate how each of the statistics in part (a) would change: increase, decrease, or stay about the same.
5. The following are quiz scores from two Algebra 1 Classes.

*Class 1: {68, 93, 53, 100, 77, 86, 91, 88, 72, 74, 66, 82} and Class 2: {77, 91, 82, 68, 75, 72, 85, 65, 70, 79, 94, 86}*

1. Compare the means of the class scores. Which would you rather be in?
2. Compare the standard deviations. Which class was more consistent in their scores?
3. Based solely on the mean and median given, decide on the shape of the distribution, and what measure of center and spread you would report.
4. Mean = 100 (b) Mean = 20 (c) Mean = 934

Median = 98 Median = 41 Median = 850

1. Use the following set of data:

{3, 4, 4, 4, 5, 6, 6, 7, 8, 10, 11, 11, 16, 17, 20, 25, 28, 30, 31, 39, 45, 59, 68, 73}

1. Look at (not draw) a histogram of the data (just use Zoom 9, no need to adjust the window).
2. Describe the distribution (be sure to use the correct measure of center and spread)
3. Are there any outliers present? Justify your answer.
4. Give a set of numbers that would have a standard deviation of 0
5. The Presidents of the USA and their Age of Death. Create a Relative Frequency Histogram and describe the distribution.

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| Washington | 67 | Polk | 53 | Garfield | 49 | Coolidge | 60 |
| J. Adams | 90 | Taylor | 65 | Arthur | 56 | Hoover | 90 |
| Jefferson | 83 | Fillmore | 74 | Cleveland | 71 | F.D. Roosevelt | 63 |
| Madison | 85 | Pierce | 64 | B. Harrison | 67 | Truman | 88 |
| Monroe | 73 | Buchanan | 77 | McKinley | 58 | Eisenhower | 78 |
| J.Q. Adams | 80 | Lincoln | 56 | T. Roosevelt | 61 | Kennedy | 46 |
| Jackson | 78 | A. Johnson | 66 | Taft | 60 | L. Johnson | 64 |
| Van Buren | 79 | Grant | 63 | Wilson | 67 | Nixon | 81 |
| W.H. Harrison | 68 | Hayes | 70 | Harding | 57 | Reagan | 93 |
| Tyler | 71 |  |  |  |  |  |  |