Math Virtual Learning

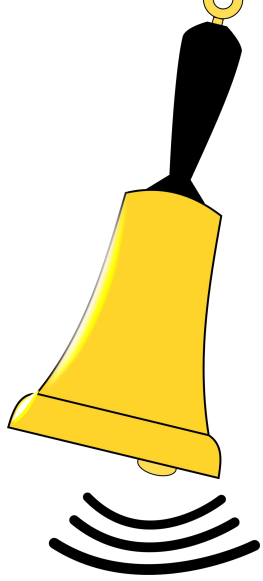# Probability and Statistics

April 14, 2020

Probability and Statistics
Lesson: April 14, 2020

Objective/Learning Target:

Students will be able to calculate the standard deviation for a set of data <u>using online technology</u>

What are the 6 steps to calculating Standard Deviation?
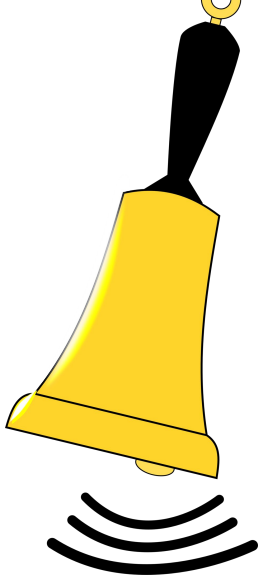
1.
2.
3.
4.

5.
6.

What are the 6 steps to calculating Standard Deviation?

1. Calculate the mean

2. Subtract the mean from each data point

3. Square the answers to Step 2

4. Sum (add) the answers to Step 3

5. Divide by n-1

6. Square Root the answer to Step 5

Standard Deviation
Day 2

Calculating Standard Deviation using Technology

Today you will learn how to use the Desmos Program to work the 6 steps in a much quicker fashion.

So why did we learn it by hand?

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Calculating standard deviation step by step

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Introduction

In this article, we'll learn how to calculate standard deviation "by hand".

Interestingly, in the real world no statistician would ever calculate standard deviation by hand. The calculations involved are somewhat complex, and the risk of making a mistake is high. Also, calculating by hand is slow. Very slow. This is why statisticians rely on spreadsheets and computer programs to crunch their numbers.

So what's the point of this article? Why are we taking time to learn a process statisticians don't actually use? The answer is that learning to do the calculations by hand will give us insight into how standard deviation really works. This insight is valuable. Instead of viewing standard deviation as some magical number our spreadsheet or computer program gives us, we'll be able to explain where that number comes from.

Using Desmos to Find Standard Deviation

- Click here to open your own [Desmos Calculator](#) page.

- Watch [this video](#) to learn how to use Desmos to calculate standard deviation for a set of data.
  - Note that you can put your data set in the x_1 OR the y_1 column of your table.

Using Desmos to Find the 5-Number Summary

Watch [the video](#) to learn how to use [Desmos](#) to calculate five-number summary for a set of data. Stop the video at 2:25.

Things to remember:

- To delete an existing list, click the X in the upper right corner of the table.
- When choosing a function for standard deviation:
  - Be sure to use **stdev** (sample standard deviation)
- Take your time entering the numbers, it is important that they are entered correctly in order to get the correct standard deviation answer.

Your Turn...

Use the following data sets and try to find the Standard Deviation for each one using your cal

1. 4, 8, 5, 9, 10, 2, 6

2. 31, 52, 41, 16, 29

3. 22, 99, 102, 33, 57, 75, 100, 81, 62, 29

4. 85, 100, 92, 96, 87, 94, 75

5. 8, 4, 6, 6, 7, 7, 9, 4, 8, 5

Your Turn… **ANSWERS**

Use the following data sets and try to find the Standard Deviation for each one using your cal

1. 4, 8, 5, 9, 10, 2, 6   **Sx = 2.87**

2. 31, 52, 41, 16, 29   **Sx = 13.52**

3. 22, 99, 102, 33, 57, 75, 100, 81, 62, 29   **Sx = 30.44**

4. 85, 100, 92, 96, 87, 94, 75

     Sx = 8.32

5. 8, 4, 6, 6, 7, 7, 9, 4, 8, 5

     Sx = 1.71