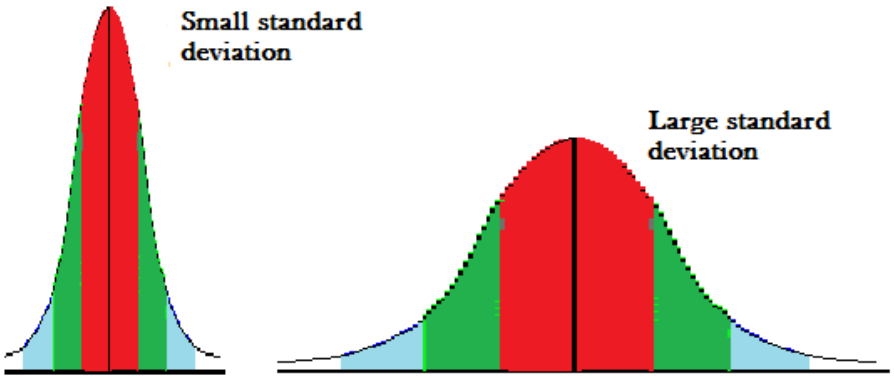
Statistics - Show measures of average or how consistent or reliable data is

- standard deviation: shows how much data varies
- r^2 value: shows how closely data follows trend line

Standard Deviation (σ)

- If data is close together, the standard deviation will be small.
- If data is spread out, the standard variation will be big
- Can be used as a measure of trials or experiment as a whole.



Standard Deviation (σ)

$$\sigma = \sqrt{\frac{\sum(x - \bar{x})^2}{N}}$$

Example: The following scores were collected for a midterm exam given to six biology students. Use the formula to calculate the standard deviation. Show all work!

52, 68, 72, ~~86, 90, 98~~

$52 - 64 = -12^2 = 144$

$68 - 64 = 4^2 = 16$

$72 - 64 = 8^2 = 64$

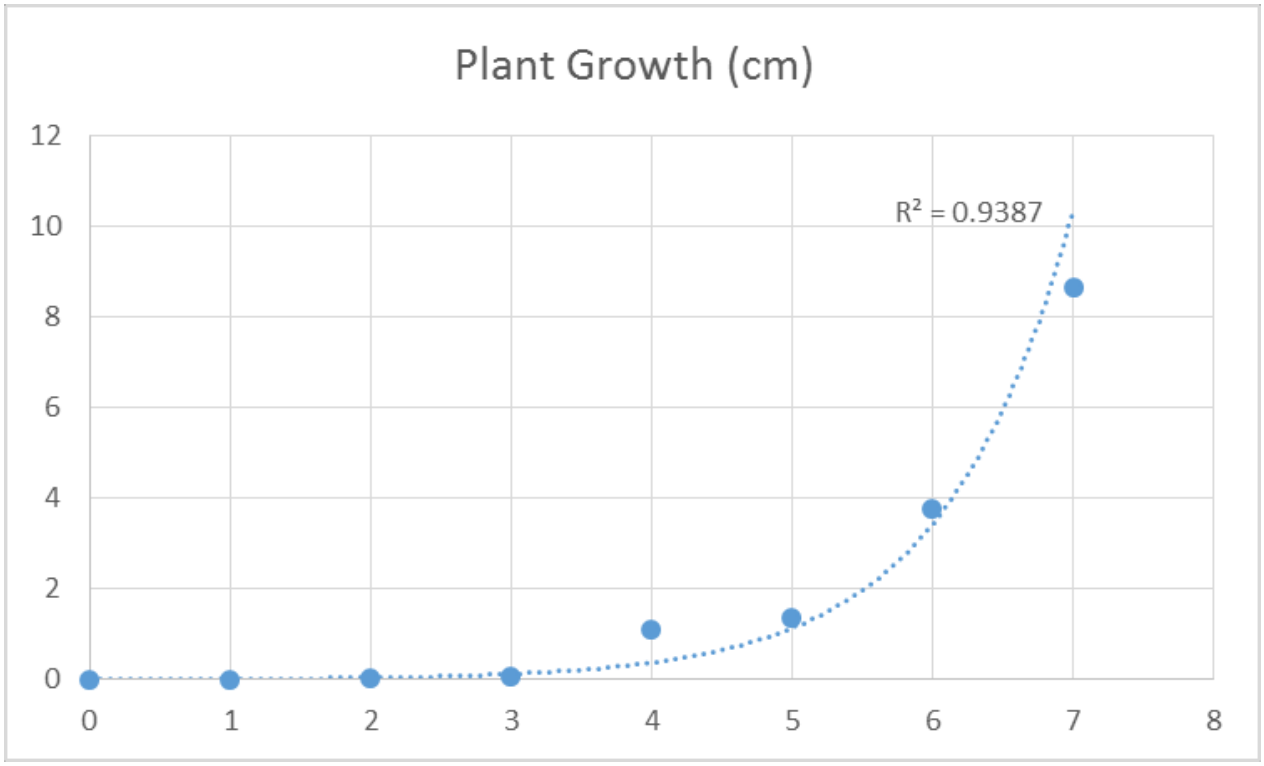
$224/3 = \sqrt{74.7} = 8.6$

R^2 Value

- R^2=1.00, data follows projected trendline 100% of the time.
- The smaller the r^2 value, the less consistently it follows the trend-line.

- **Procedure:**
  - Graph data
  - Select (+) button
  - Click the arrow next to trend line and select "more options"
  - Select appropriate trend line
  - Select "display r^2 value on chart".

pH	Plant Growth (cm)
0	0.01
1	0.01
2	0.02
3	0.05
4	1.12
5	1.35
6	3.78
7	8.64


Plant Growth (cm)
12
10
8
6
4
2
0
0
1
2
3
4
5
6
7
8
R² = 0.9387