Notes: Chapter 2.2 Day #1 Normal Distributions

**What is a Normal Distribution?**

* Last class, we briefly looked at density curves
* Once special type of density curve is the ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_****.*
* These density curves are symmetric, single peaked, and bell shaped. *Normal curves* describe **Normal distributions**.
  + All Normal distributions, although they may vary in appearance somewhat, have the same overall shape.
* We describe a Normal distribution by giving its **\_\_\_\_\_\_\_\_\_** and its **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
* Because Normal distributions are symmetric, the mean is located in the \_\_\_\_\_\_\_ of the distribution and is \_\_\_\_\_\_\_ to the median.

**Changing the Mean and Standard Deviation:**

* Changing μ without changing σ:
* Changing σ without changing μ:

**Inflection Points:**

* The points at which the change in the Normal distributions curvature take place (where is goes from a steep decline to a less steep decline) are called the *inflection points*.
* Sketch:
* **Why are these points useful?**
* **WARNING!:**

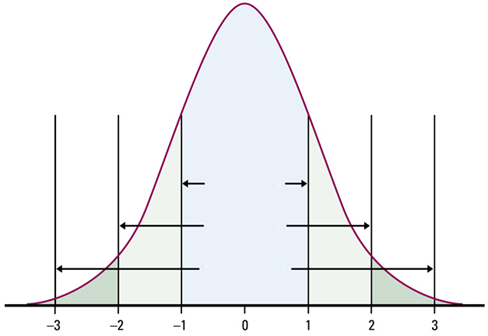
**Why the Normal Distribution?**

(1)

(2)

(3)

**WARNING**: Although many sets of data follow a Normal distribution, there are also many that do not.

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**The 68-95-99.7 Rule (AKA the Empirical Rule)**

* **Approximately \_\_\_\_\_ of the observations**

**fall within σ of μ.**

* **Approximately \_\_\_\_\_ of the observations**

**fall within 2σ of μ.**

* **Approximately \_\_\_\_\_ of the observations**

**fall within 3σ of μ.**

**Using the Empirical Rule:**

* Heights of young women, μ = 64.5 inches and σ =2.5 inches.
* Ex1) Between what heights do 95% of women fall?
* Ex2) There are 100 women in a room. What # of women would we expect to have heights within 1 standard deviation of the mean?
* Ex3) There are 11 women in this room. What # would we expect to have heights greater than 67?

**Notation:**

Because Normal distributions come up a lot in statistics, we abbreviate a Normal distribution with a mean μ and a standard deviation σ as

**N(μ ,σ)**

For example, the distribution of young women’s heights would be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.