Name: _____ Date: _____ **Unit 2 Class Work**

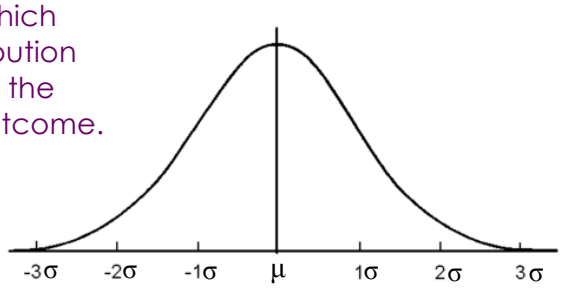
Normal Distribution Curve Class Work

Objective: You will be able to estimate population percentages & analyze data using a normal distribution.

★ Normal Distributions

A normal distribution is an arrangement of a data set in which most values cluster around the mean. Every normal distribution curve has a symmetric bell shape, and the area between the curve and the x-axis represents the probability of each outcome.

Heights, sizes, test scores, etc. typically can be modeled by a normal distribution curve.



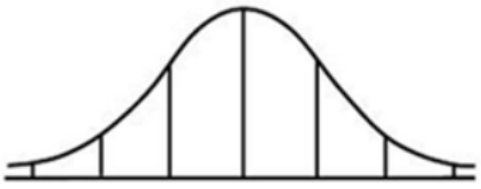
When data is normally distributed, the following aspects hold:

- The area under the entire curve is 1, or _____.
- The curve approaches, but never actually intersects the x-axis
- _____ of the data fall within 1 standard deviation from the mean (the area under the curve from -1σ to 1σ is _____)
- _____ of the data fall within 2 standard deviations from the mean
- Any values outside of _____ standard deviations from the mean are considered statistically significant outliers (since they are only 5% of the data)
- _____ of the data wall within 3 standard deviations from the mean

Guided Example 1:

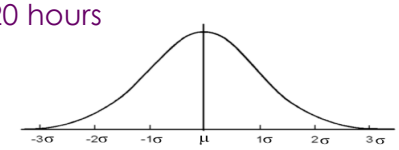
In a survey conducted by a national health center, the sample mean height of women ages 21 to 35 was 66 inches, with a standard deviation of 2.5 in.

a. Estimate the percent of the women whose heights are between 63.5 and 68.5 inches.
b. Between which two heights do 95% of women who were surveyed fall?
c. Estimate the percentage of women whose heights were between 66 & 71 inches.



Practice!

2. The mean battery life of a certain battery is found to be 320 hours with a standard deviation of 14 hours.



a. What is the probability that a battery will last between 306 and 348 hours?

b. What is the probability that the battery of a will not last longer than 362 hours?

c. If Billy has 25 of these batteries, approximately how many can he expect to last more than 348 hours?

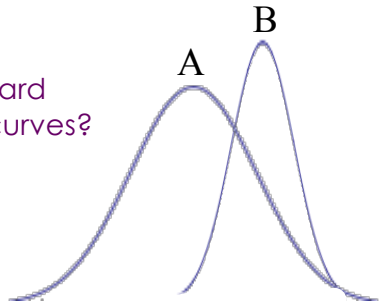
3. The average height of horses and ponies on a farm is 16.5 hands, with a standard deviation of 0.75 hands.

a. What is the probability that a horse on the farm is between 15 and 17¼ hands?

b. Horses under 14.25 hands are *usually* considered ponies. If there are 40 horses on the farm, approximately how many would you expect to be ponies?

4. Some bags of sugar are weighed. The results of the data collection show that $\mu = 505$ grams, and $\sigma = 12$ grams. The bags are supposed to contain 500 grams of sugar each. What can you conclude about the company that produces these bags? Support your answer.

5. Which data set has a higher mean? Which has a higher standard deviation? How did you know this, given the normal distribution curves?

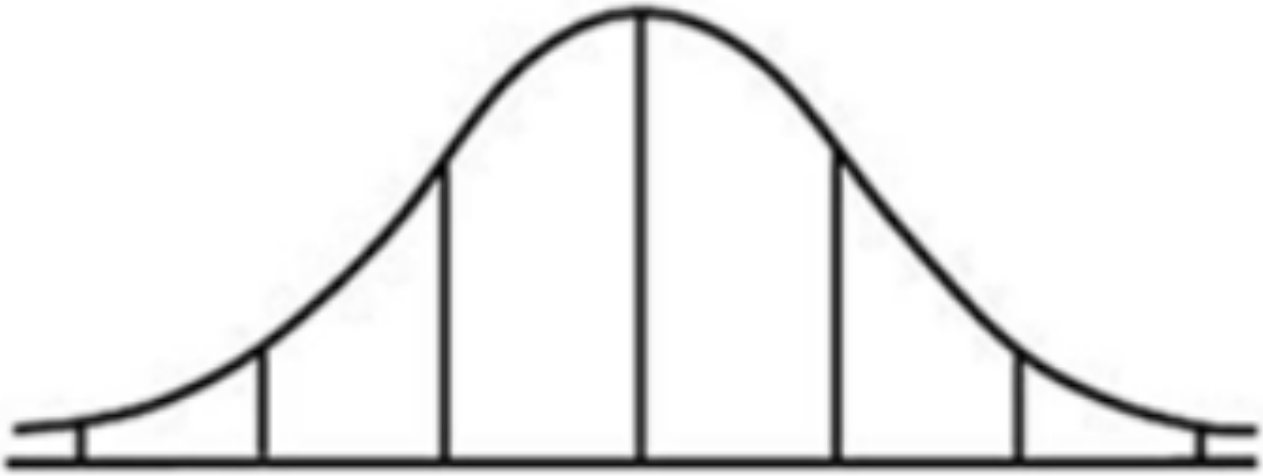


6. The heights of males in a school are approximately normally distributed, with 95% of the heights between 66 and 72 inches. The standard deviation is 1.5 inches. Estimate the mean height of the population.

7. The number of cashews in bags of mixed nuts is approximately normally distributed, with 99.7% of the number of cashews per bag being between 43 and 58 cashews. The standard deviation is 2.5 cashews. Estimate the mean number of cashews per bag.

Homework: p. 681-683 #5, 6, 9, 11, 14-16, 18, 19, & 32-34

Normal Distribution Curve Percentages



Exit Slip:

Write down any questions you still have regarding the normal distribution curve.

OR

Explain how your knowledge of statistics has improved after learning about the normal distribution curve.

OR

Create any problem that could be solved using the normal distribution curve.

Exit Slip:

In a set of data, $\mu = 33$ and $\sigma = 4.5$.

a. Sketch a normal distribution curve for this data.

b. What percentage of the population would you estimate to fall between the values of 28.5 and 42?

c. Complete the blanks:
Values above _____ and below _____ would be considered statistically significant (outliers).

d. Assuming there were 500 values in the data set, how many of the values would you expect to fall between 28.5 and 37.5?