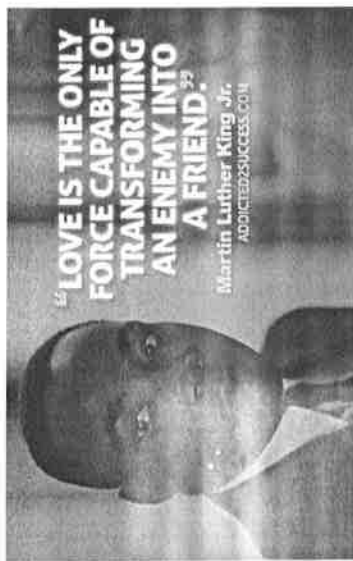


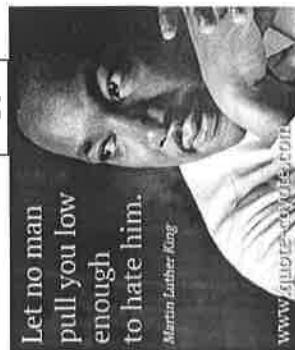


Name: _____

30		25	Introduction Activities Pre-Test HW: Syllabus signed, log on to Canvas, remind and pchsecm.weebly.com Watch video on sampling	26	SAMPLING & VARIABLES POWERPOINT CW: JIGSAW & ASSIGN PROJECT HW: Worksheet on Sampling Syllabus signed, log on to Canvas, log on to remind Watch video on sampling	27	
31	Project Questions – Groups and Topic selections are due Statistical Graphs HW: Worksheet and Study for Quiz	1	Empirical Rule HW: Worksheet	2	Empirical Rule Project HW: Worksheet on Empirical Rule, Study for Quiz and Project	3	 Quiz on Empirical Rule Finish Projects and get them approved
6	Project Presentations- TEST GRADE	7	8	9	10	10	

Algebra 2 Pre-Test

Please do not write on this test. A calculator is not allowed.

1. Simplify the expression:

$$4 + 36 \div (10 - 8)^2 \cdot 3 + 7$$

- A. 130
- B. 100
- C. 38
- D. 37

2. Evaluate the expression $-4x + 5y - 14$

when $x = 0$ and $y = \frac{3}{5}$.

- A. -1
- B. -11
- C. -15
- D. -51

3. Simplify the expression:

$$1 + 4(2x - 3) - x$$

- A. $9x - 3$
- B. $9x - 15$
- C. $7x - 2$
- D. $7x - 11$

4. Simplify the expression:

$$7x^2 - 6 + 4x + 7 - 5x^2 + x$$

- A. $2x^2 + 5x + 1$
- B. $2x^2 + 4x + 1$
- C. $12x^2 + 5x + 1$
- D. $12x^2 + 4x + 1$

5. A function is defined as

$$f(x) = -3x^2 + 2x - 5$$

What is $f(-1)$?

- A. -16
- B. -10
- C. -6
- D. -4

6. Solve the equation for x :

$$\frac{x}{3} + 7 = -5$$

- A. -36
- B. -22
- C. -6
- D. -4

7. Solve the equation for x :

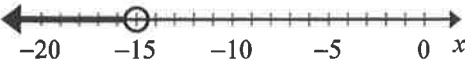
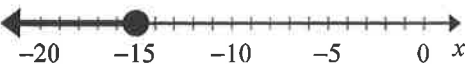
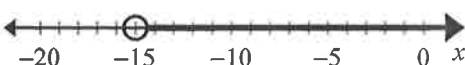

$$5(x - 2) + 4(3 + x) = 20$$

- A. -2
- B. $-\frac{2}{9}$
- C. $\frac{5}{3}$
- D. 2

Algebra 2 Pre-Test

Please do not write on this test. A calculator is not allowed.

8. Which graph represents the solution to the inequality $x + 6 \leq -9$?

- A. 
- B. 
- C. 
- D. 

9. Solve the inequality for x :

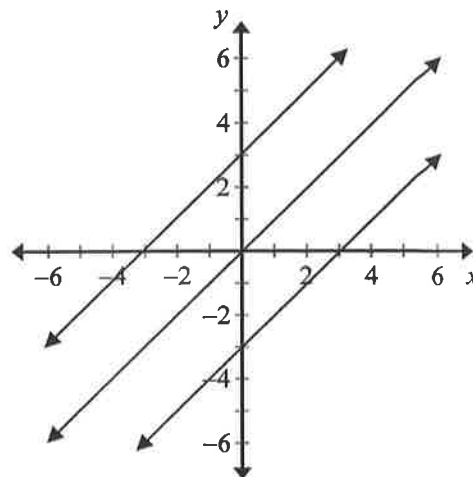
$$5 - 3x < 20$$

- A. $x > -\frac{25}{3}$
- B. $x > -5$
- C. $x < -\frac{25}{3}$
- D. $x < -5$

10. What is the solution set of $|3x - 2| = 7$?

- A. $\{3\}$
- B. $\{-3, 3\}$
- C. $\left\{-\frac{5}{3}, 3\right\}$
- D. $\left\{-\frac{5}{3}\right\}$

11. Which statement is true about the characteristics of the three lines in the graph?



- A. They have the same equation.
- B. They have the same slope.
- C. They have the same x -intercept.
- D. They have the same y -intercept.
12. Calculate the slope of the line that passes through the points $(-4, -7)$ and $(1, -7)$.
- A. undefined
- B. 0
- C. $\frac{14}{5}$
- D. $\frac{14}{3}$

Name: _____

Unit 1 Day 3 CW – Statistical Analysis Jigsaw Activity

Define and give an example of the following:

	Definition	Example
Population		
Sample		
Random Sampling		
Systematic Sampling		
Cluster Sampling		
Stratified Sampling		
Convenience Sampling		
Categorical Data		
Quantitative Data		

Unit 1 – Day 2 Homework
Sampling and Types of Data

Identify the Sampling Technique used in each of the following as Stratified, Systematic, Cluster, Random or Convenience.

1. A group of people are classified according to age and then random samples of people from each group are taken.
2. Every 15th iPhone coming off an assembly line is checked for defects.
3. A state is divided into regions using zip codes. A random sample of 20 zip code areas is selected.
4. A door prize is given away at a teachers' convention. Tickets are placed in a bin and the tickets are mixed up. Then a ticket is selected by a blindfolded person.
5. Every 17th person in a line to buy ticket to see Star Wars is asked his or her age.
6. The business in Cary are grouped according to type: medical, service, retail, manufacturing, financial, construction, restaurant, hotel, tourism, and other. A random sample of 10 businesses from each type is selected.
7. The first 25 students leave the cafeteria are asked how much money that spent on shoes for the semester.
8. The Food and Drug administration randomly selects five stores from each of four randomly selected sections of a large city and checks food items for freshness. These stores are used a representative sample of the entire city.
9. Bingo balls in a bin are shaken and then balls are selected from the bin.
10. The Students Senate at North Carolina State University is electing a new president. The first 25 people leaving the library are asked for whom they will vote.

Determine if the variables listed below are *quantitative* or *categorical*. Neatly print "Q" for quantitative and "C" for categorical.

_____ 1. Time it takes to get to school

_____ 8. Height

_____ 2. Number of shoes owned

_____ 9. Amount of oil spilled

_____ 3. Hair color

_____ 10. Age of Oscar winners

_____ 4. Temperature of a cup of coffee

_____ 11. Type of pain medication

_____ 5. Teacher salaries

_____ 12. Jellybean flavors

_____ 6. Gender

_____ 13. Country of origin

_____ 7. Facebook user

_____ 14. Type of meat

Analyzing Statistical Data Day 3

I. Measures of Central Tendency

1. How do you find the mean (average) of data? _____

2. Find the average height in cm of top college defensive backs in 2015.
3. How do you find the median of data? _____

4. Find the median height in cm of the top 20 college defensive backs in 2015.
5. How do you find the mode of data? _____

6. Find the mode in cm of the height of the top 20 college defensive backs in 2015
7. How do you find the range of data? _____

8. Find the range of the data

II. Box and Whisker Plots

a. Five Point Summary:

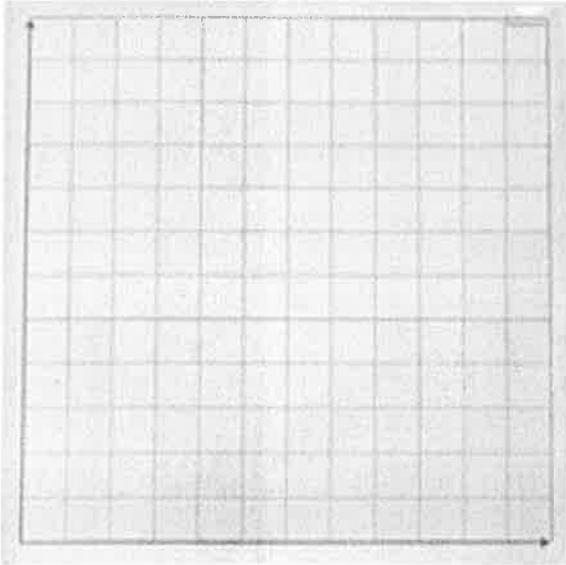
- i. Lower Extreme
- ii. Q1
- iii. Median
- iv. Q3
- v. Upper Extreme:
- vi. Shape:

b. Find the five point summary for the *height* in cm of the 19 college defensive backs in 2015 and create a Box and Whisker Plot.

- i. Lower Extreme
- ii. Q1
- iii. Median
- iv. Q3
- v. Upper Extreme:
- vi. Shape:

III. Histogram and Frequency Table

- i. Choose a width for you data
 - ii. Create a frequency table
 - iii. Graph the data as a bar chart except bars should be adjacent with one another
 - iv. Label your axis
- b. Create a histogram and a frequency table for the height in cm of the 19 college defensive backs in 2015



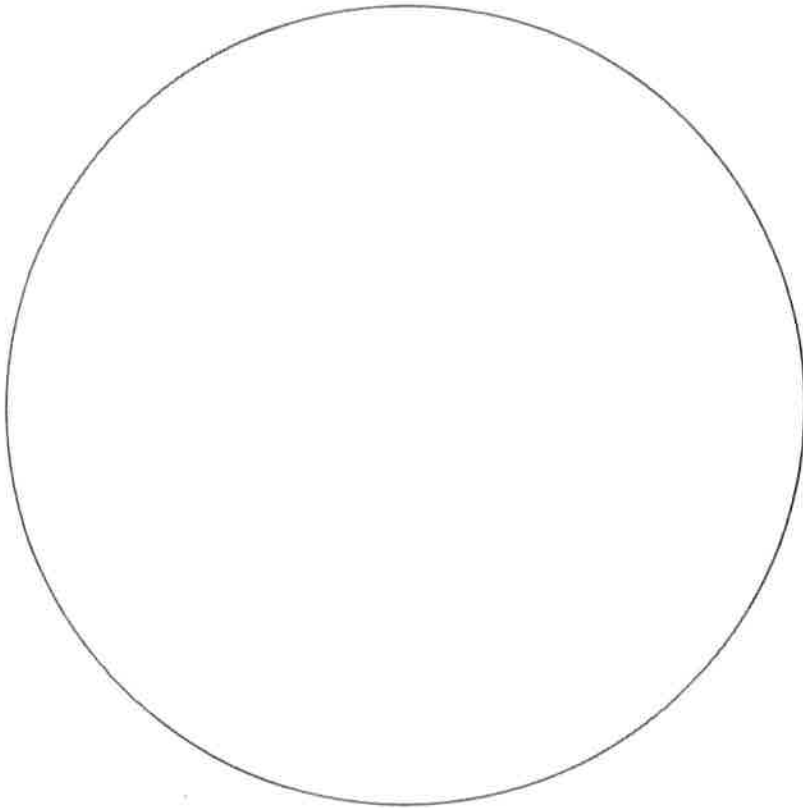
Weight	Frequency

IV. Stem and Leaf plot

- a. The stem will be the hundreds column (depending on size of your data) and the leaves will be the tens column
- b. Create a key
- c. Create a stem and leaf plot for the height in cm for the 19 college defensive backs in 2015

V. Pie Chart

- a. Using the frequency table, find the percentage of each category
- b. Find the angle represented by each category (multiple the % by 3.6)
- c. Create a pie chart using the frequency table created in part III
- d. Color each section and make a key



Width	Frequency	%	Angle (% x 3.6)

VI. Line Plots

- a) Create a number line on the horizontal axis to include the range of your data
- b) For each data item represented for the point, add an x in the vertical direction.
- c) Make a line plot to represent your data



Homework/Classwork:

Use the Data for the **weight** of 2015 College Defensive Backs to find the following:

I. Central Tendency Data

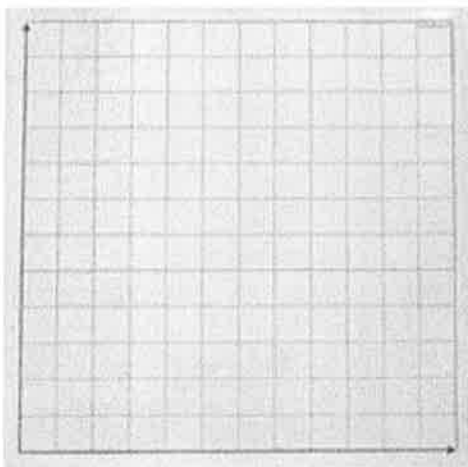
- a. Mean
- b. Median
- c. Mode
- d. Range

II. Box & Whisker Plot

- a. Lower Extreme
- b. Q1
- c. Median
- d. Q2
- e. Upper Extreme
- f. Graph the plot

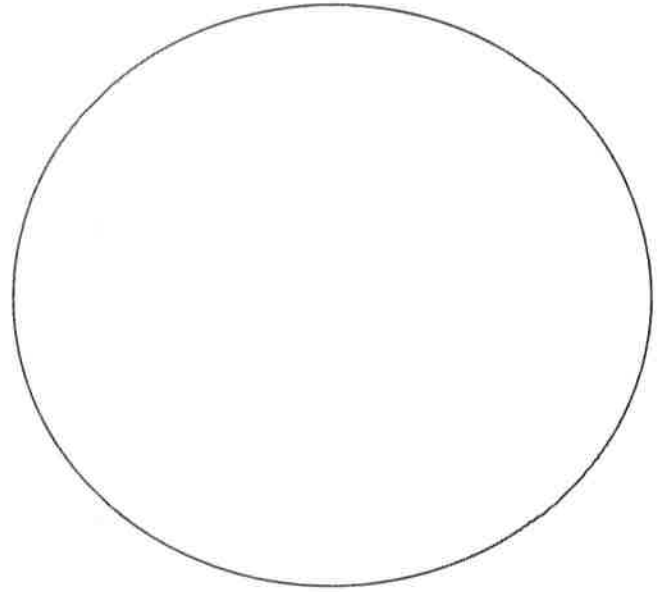
III. Create a stem and leaf plot

IV. Create a Histogram and frequency table using the graph below



Weight	Frequency
176-180	
181-185	
186-190	
191-	

V. Create a Pie Chart, using the circle below



Width	Frequency	%	Angle (% x 3.6)

VI. Create a line plot on the line provided



Guided Notes on the Normal Distribution and Empirical Rule

Normal Distribution

The Normal Distribution is a type of _____.

The graph of a Normal Distribution is called a _____ or more commonly referred to as _____.

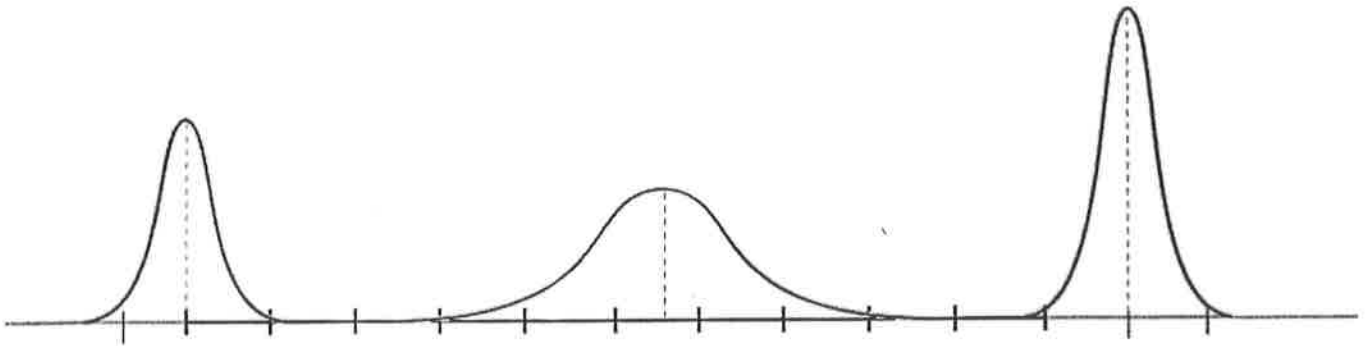
Properties of the Normal Distribution:

- The mean, median, and mode are _____
- _____ about the mean
- Area under the curve equals _____
- Curve never _____ the x-axis

Limits to the mean and standard deviation

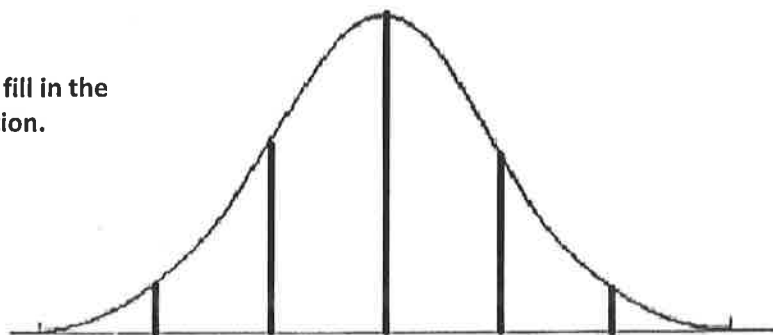
- The mean, or μ , ranges between _____ and _____.
- The standard deviation, or σ , must be _____.

Regardless of the height or width of the curve the areas under each of these curves is always equal to 1.



If the graph is more spread out, like the one in the middle, it has a _____.

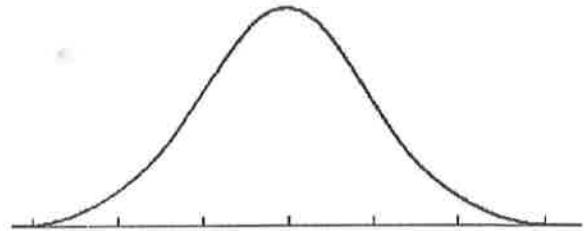
Use the Empirical Rule to fill in the percentages for each section.



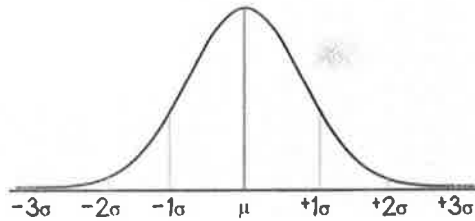
Estimate Population Percentages

Sketch the normal curve for birth weights of babies if the weights are normally distributed with a mean of 7.6 lbs and a standard deviation of 1.3 lbs.

- a. What percentage of babies weigh under 5 lbs.?
- b. What percentage of babies weigh between 7.6 lbs. and 11.5 lbs.?
- c. What percentage of babies weigh over 10.2lbs.?



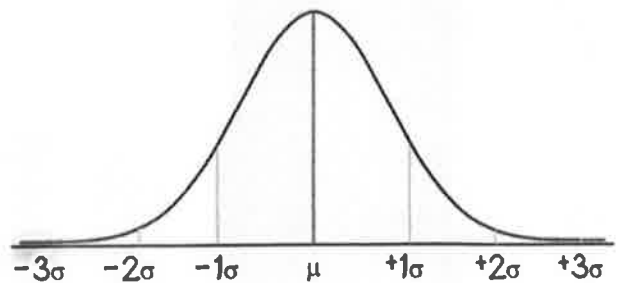
Adult American female heights
 Mean = 65"
 Standard Deviation = 2.5"



- 26. What percentage of adult American females are taller than 5'10"?
- 27. What percentage of adult American females are between 60" and 67.5" tall?
- 28. What percentage of adult American females are shorter than 5'2.5"?
- 29. What percentage of adult American females are between 65" and 70"?
- 30. What percentage of adult American females are taller than 5'2.5"?
- 31. What percentage of adult American females are shorter than 70"?

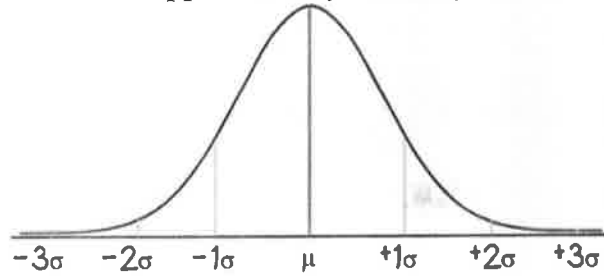
Students counted the number of candies in 100 small packages. They found that the number of candies per package was normally distributed with a mean of 23 candies per package and a standard deviation of 1 piece of candy.

- 32. Draw the graph of the normal distribution.
- 33. About how many packages have between 21 and 24 candies?
- 34. What is the probability that a package selected at random has more than 25 candies?



Additional Examples.

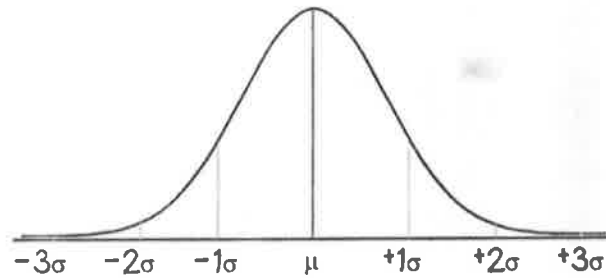
The heights of adult American males are approximately normally distributed with mean 69.5 in. and standard deviation 2.5 in.



35. What percent of adult American males are between 67 in and 74.5 in tall?

36. In a group of 2000 adult American males, about how many would you expect to be taller than 6ft?

The scores on the Algebra 2 final are approximately normally distributed with a mean of 150 and a standard deviation of 15.



37. What percentage of the students who took the test scored above 180?

38. If 250 students took the final exam, approximately how many scored above 135?

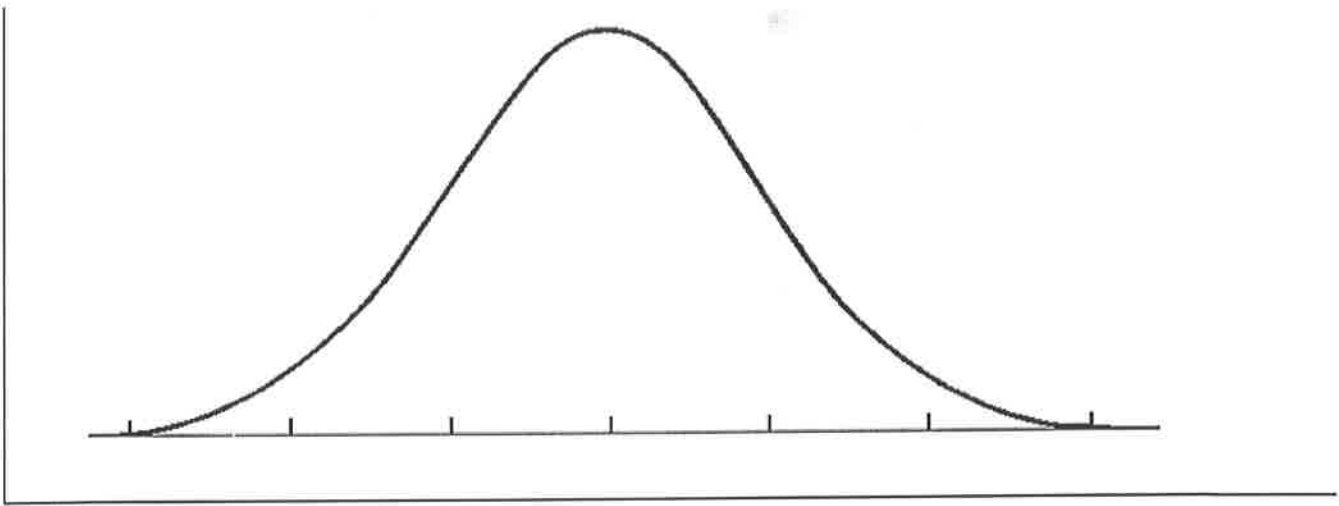
39. If 13.5% of the students received a B on the final, how can you describe their scores? Explain.

M414 – Chapter 3
Worksheet 3 - Empirical Rule and Normal Distribution

Name _____
Date _____ Period _____

In a normal distribution, what percent of the values lie:

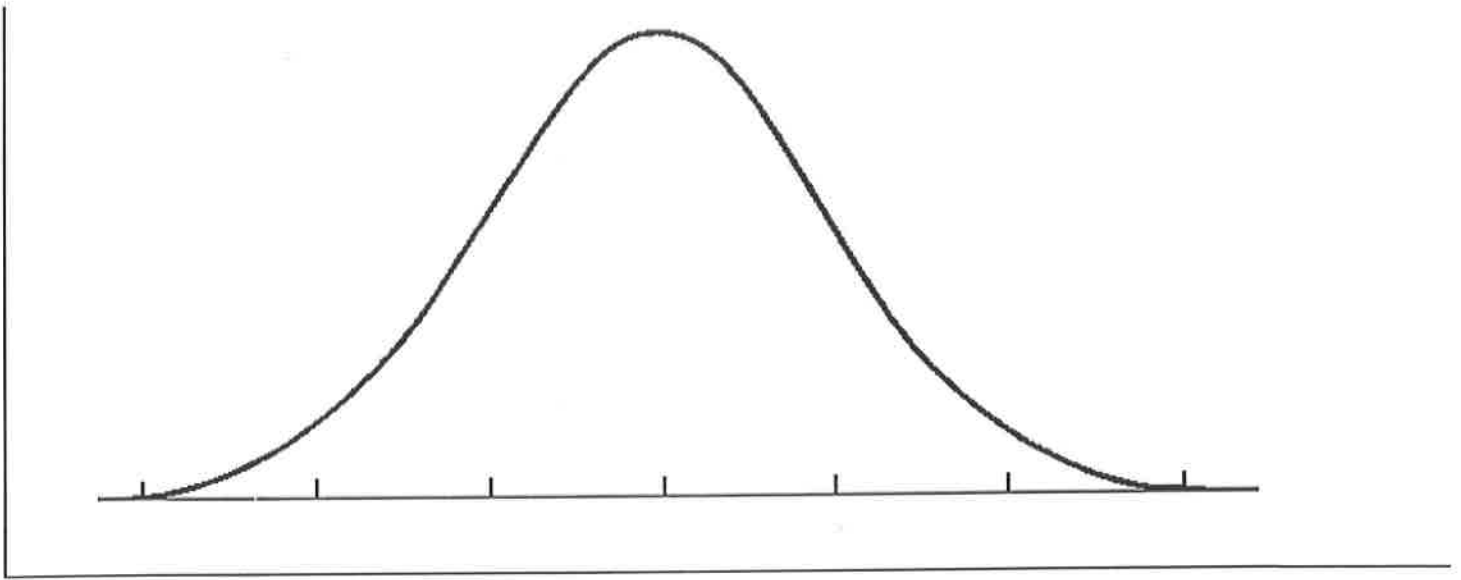
1. below the mean? _____
2. above the mean? _____
3. within one standard deviation of the mean? _____
4. within two standard deviations of the mean? _____
5. within three standard deviations of the mean? _____
6. **2000 freshmen at State University took a biology test. The scores were distributed normally with a mean of 70 and a standard deviation of 5. Label the mean and three standard deviations from the mean.**



Answer the following questions based on the data:

- a) What percentage of scores are between scores 65 and 75?
- b) What percentage of scores are between scores 60 and 70?
- c) What percentage of scores are between scores 60 and 85?
- d) What percentage of scores is less than a score of 55?
- e) What percentage of scores is greater than a score of 80?
- f) Approximately how many biology students scored between 60 and 70?
- g) Approximately how many biology students scored between 55 and 60?

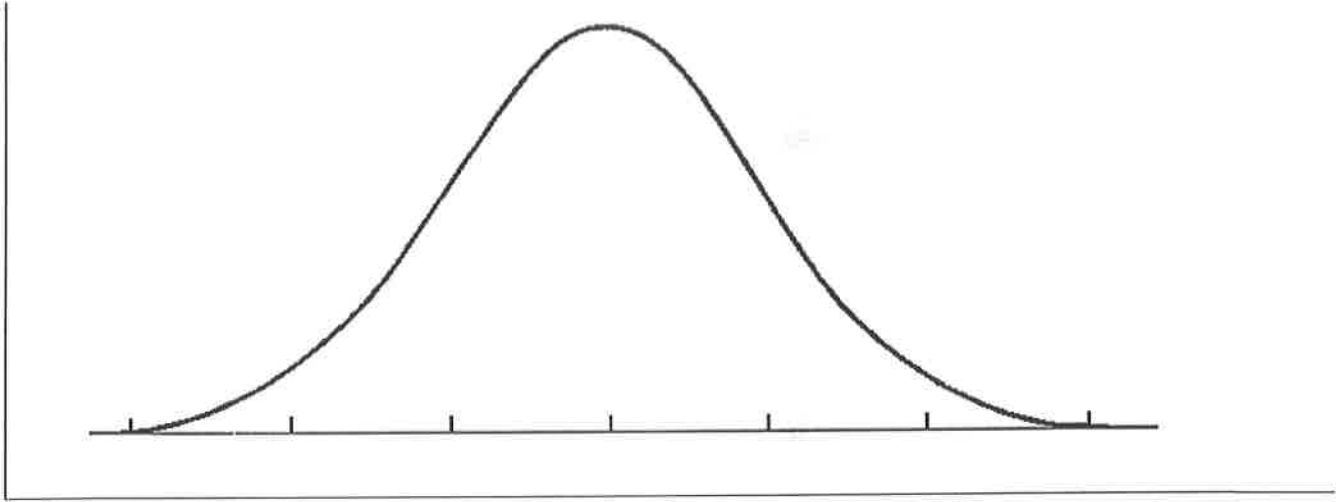
7. 500 juniors at Central High School took the ACT last year. The scores were distributed normally with a mean of 24 and a standard deviation of 4. Label the mean and three standard deviations from the mean.



Answer the following questions based on the data:

- What percentage of scores are between scores 20 and 28?
- What percentage of scores are between scores 16 and 32?
- What percentage of scores are between scores 16 and 28?
- What percentage of scores is less than a score of 12?
- What percentage of scores is greater than a score of 24?
- Approximately how many juniors scored between 24 and 28?
- Approximately how many juniors scored between 20 and 28?
- Approximately how many juniors scored between 24 and 32?
- Approximately how many juniors scored between 16 and 20?
- Approximately how many juniors scored higher than 32?

8. 500 freshmen at Schaumburg High School took an algebra test. The scores were distributed normally with a mean of 75 and a standard deviation of 7. Label the mean and three standard deviations from the mean.



Answer the following questions based on the data:

- What percentage of scores are between scores 61 and 82?
- What percentage of scores are between scores 75 and 82?
- What percentage of scores are between scores 61 and 89?
- What percentage of scores is less than a score of 61?
- What percentage of scores is greater than a score of 96?
- Approximately how many algebra students scored between 61 and 89?
- Approximately how many algebra students scored between 68 and 82?
- Approximately how many algebra students scored between 61 and 75?
- Approximately how many algebra students scored between 89 and 96?
- Approximately how many algebra students scored higher than 89?

9. Here are the scores for a recent test in M414 Statistics.

90 90 95 100 80 80 75 80 70 60 95 100 100
100 75 80 90 90 90 70 70 80 85 90 90 85

Answer the following questions regarding this set of data.

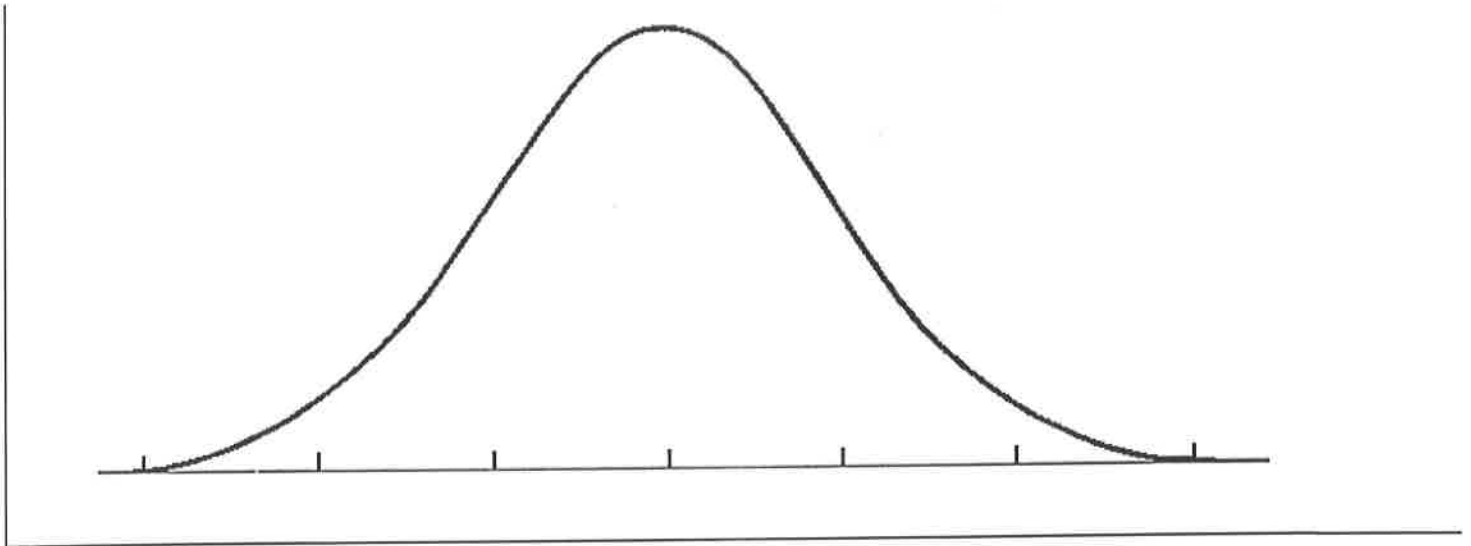
Median = _____ Mean = _____ Mode = _____

Standard Deviation = _____ Variance = _____

How many scores are within 1 standard deviation of the mean? _____

How many scores are within 2 standard deviations of the mean? _____

Hint: Drawing the curve will help answer the last two questions!!!



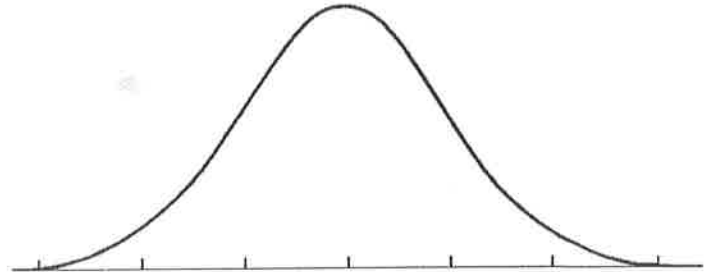
Name: _____

Using the Empirical Rule

For each problem set, label the normal curve with the appropriate values, and use the curve to answer the questions.

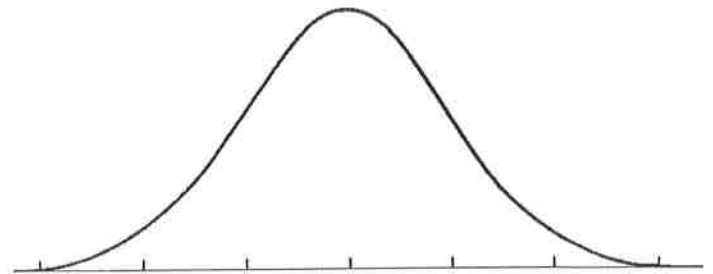
1. The mean score on the midterm was an 82 with a standard deviation of 5. Find the probability that a randomly selected person:

- a. scored between 77 and 87
- b. scored between 82 and 87
- c. scored between 72 and 87
- d. scored higher than 92
- e. scored less than 77



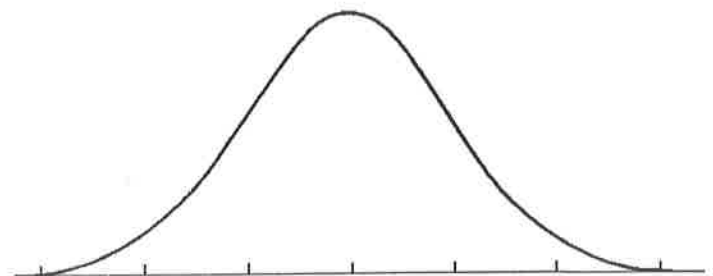
2. The mean SAT score is 490 with a standard deviation of 100. Find the probability that a randomly selected student:

- a. scored between 390 and 590
- b. scored above 790
- c. scored less than 490
- d. scored between 290 and 490



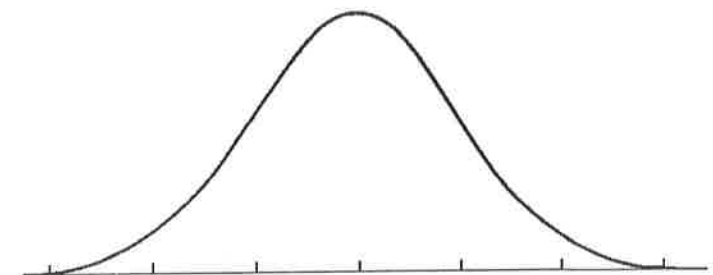
3. The mean weight of college football players is 200 pounds with a standard deviation of 30. Find the probability that a randomly selected player:

- a. weighs between 170 and 260
- b. weighs less than 170
- c. weighs over 290
- d. weighs less than 140
- e. weighs between 140 and 230



4. The average life of a car tire is 28,000 miles with a standard deviation of 3000. Find the probability that a randomly selected tire will have a life of:

- a. between 19,000 and 37,000 miles
- b. less than 25,000 miles
- c. between 31,000 and 37,000 miles
- d. over 22,000 miles
- e. below 31,000 miles



Empirical Rule WS

1. Given an approximately normal distribution what percentage of all values are within 1 standard deviation from the mean?
2. Given an approximately normal distribution what percentage of all values are within 2 standard deviations from the mean?
3. Given an approximately normal distribution what percentage of all values are within 3 standard deviations from the mean?
4. Given an approximately normal distribution with a mean of 175 and a standard deviation of 37.
 - a) Draw a normal curve and label 1, 2, and 3 standard deviations on both sides on the mean.
 - b) What percent of values are within the interval (138, 212)?
 - c) What percent of values are within the interval (101, 249)?
 - d) What percent of values are within the interval (64, 286)?
 - e) What percent of values outside the interval (138, 212)?
 - f) What percent of values are outside the interval (101, 249)?
 - g) What percent of values are outside the interval (64, 286)?

5. Given an approximately normal distribution with a mean of 121 and a standard deviation of 40.

a) Draw a normal curve and label 1, 2, and 3 standard deviations on both sides on the mean.

b) What interval contains 68% of all values?

c) What interval contains 95% of all values?

d) What interval contains 99.7% of all values?

e) What percent of values are above 201?

f) What percent of values are below 81?

6. Given an approximately normal distribution with a mean of 159 and a standard deviation of 70.

a) What percent of values are within the interval (89, 299)?

b) What percent of values are within the interval (19, 159)?

c) What interval contains 99.7% of all values?

d) What percent of values are above 229?

e) What percent of values are outside the interval (19, 229)?

7. The heights of male students is normally distributed with a mean of 170 cm and a standard deviation of 8 cm. Find the percentage of male students whose height is: (Draw and label a bell curve to help)

a) between 162 cm and 170 cm

b) between 170 cm and 186 cm

c) between 178 cm and 186 cm

d) less than 162 cm

e) less than 154 cm

f) greater than 162 cm

8) It is known that when a specific type of radish is grown in a certain manner without fertilizer the weights of the radishes produced are normally distributed with a mean of 40g and a standard deviation of 10g. When the same type of radish is grown in the same way except for the inclusion of fertilizer, it is known that the weights of the radishes produced are normally distributed with a mean of 140g and a standard deviation of 40g. Determine the proportion of radishes grown: (Draw the distribution)

a) Without fertilizer with weights less than 50 grams.

b) With fertilizer with weights less than 60 grams.

c) With and without fertilizer with weights between 20 and 60 grams.

d) With and without fertilizer that will have weights greater than or equal to 60 grams.

9. A bottle filling machine fills, on average, 20,000 bottles a day with a standard deviation of 2000. If we assume that the production is normally distributed and that a year comprises 260 working days, calculate the approximate number of working days that: (Draw the distribution)

a) under 18000 bottles are filled

b) over 16000 bottles are filled

c) between 18000 and 24000 bottles are filled

Name _____

Standard Deviation and Normal Curve

Given the following Normal Curve, answer the following questions:

<p>1. A set of measures that follows a normal bell curve has a mean of 80 and a standard deviation of 5. What percent of the measures fall between 75 and 80?</p> <p>_____</p>	<p>3. On a standardized test, the mean is 70 and standard deviation is 4. Between what two scores will 34.1 % of the scores fall?</p> <p>A) 58 to 62 B) 74 to 78 C) 66 to 70 D) 78 to 82</p> <p>_____</p>
<p>2. On a test, the mean score is 65 and the standard deviation is 2. Which score could be expected to occur less than 2% of the time?</p> <p>A) 50 B) 65 C) 62 D) 68</p> <p>_____</p>	<p>4. The set of numbers { 5, 11, 20 } has</p> <p>A) a range of 6 and median of 12 B) a range of 9 and median of 11 C) a range of 15 and median of 11 D) a range of 20 and median of 12</p> <p>_____</p>
<p>5. 900 people took a test. The mean score was 80. Assuming a normal distribution., theoretically how many students scored above 2 standard deviations above the mean?</p> <p>_____</p>	<p>8. The scores of an exam have a normal distribution. The mean of the score is 50 and the standard deviation is 6. What is the probability that a score chosen at random lies between 62 and 68.</p> <p>_____</p>
<p>6. A survey of part time working hours of the students in a local school revealed the mean number of hours worked per week was 15 with a standard deviation of 2.</p> <p>a) Assuming a normal distribution, what is the range of hours per week 68.2 % of the students at this school will work?</p> <p>_____</p>	<p>9. On a standardized test with a normal distribution the mean is 500 and the standard deviation is 100. If 1000 people took the test, approximately how many would theoretically score between:</p> <p>a) 450 and 550</p> <p>_____</p>

<p>b) If 2000 students attend, how many students work in the range of ± 1 standard deviation about the mean?</p> <p>_____</p>	<p>b) 400 and 600</p> <p>_____</p>
<p>7. 95.5 % of the scores on a standardized test ranged from 65 to 85, what is the mean and standard deviation?</p> <p>Mean: _____</p> <p>Standard deviation: _____</p>	<p>10. On a standardized test, Bob had a score of 85, which was exactly 1 standard deviation above the mean. If the standard deviation for this test was 7, what was the mean score for this test?</p> <p>_____</p>