MATH 154, Exam #1, Part II, Spring 2019   Name _____

Instructions: This portion of the exam is to be answered entirely in class without Excel. You may use a calculator, but it may not be on a device that connects to the Internet. Round answers to two decimal places unless the question asks for a different number of places.

1. Let the universal set be the set of numbers from 0 to 10, $U = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, inclusive. Let A be the set of all even numbers in U, $A = \{0, 2, 4, 6, 8, 10\}$, and B be the set of all numbers divisible by three in U, $B = \{0, 3, 6, 9\}$, and C be the set of prime numbers in U, $C = \{2, 3, 5, 7\}$. Use this information to answer the questions that follow.

    a. How many values are in the universal set? (3 points)
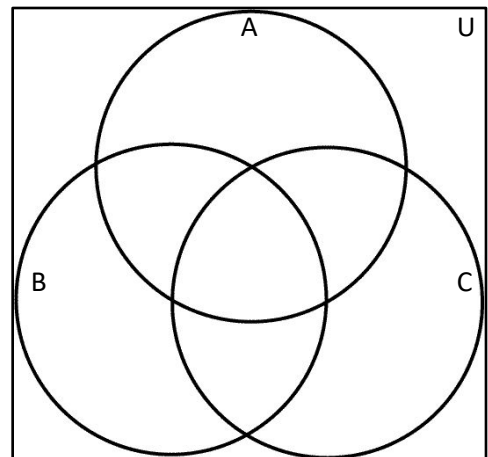
    b. How many values are in set A? (3 points)

    c. What proportion of values in the universal set are in A? (3 points)

    d. What is set B' (B-complement)? (3 points)

    e. What elements are in $A \cap B$? (3 points)

    f. What elements are in $B \cup C$? (3 points)

    g. A blank Venn Diagram is shown. Place the values in the appropriate sets or intersections on the diagram. (6 points)

2. Translate the logical notation below into English sentences if p is the statement "The plant is growing", and q is the statement "The bed is made". (4 points each)
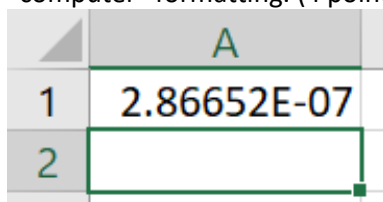
   a. $\sim p$

   b. $p \vee \sim q$

   c. $q \rightarrow p$

   d. $p \wedge q$

3. Translate the logical and mathematical notation $\exists! x (x^3 = 1 \wedge x \in R)$. (6 points)

4. The screenshot below shows how scientific notation appears in Excel. Write this number in standard scientific notation as it appears in normal mathematical notation and not in "computer" formatting. (4 points)

	A
1	2.86652E-07
2	

5. The 70th percentile of heights of women in the United States is approximately 65.6" or 5'5.6". What does this statement mean in plain English? (5 points)

6. Using the Screenshot below, complete the IF statement that is needed to determine if the value in the cell just to the left is Female, and outputs a 1 if TRUE, and 0 if FALSE. The formula should be such that it can be copied down the column to perform the same check on all the values in Column C. (6 points)

| C	D	E	F	G	H
Gender					
Male	=IF(				
Female	IF(**logical_test**, [value_if_true], [value_if_false])				
Male					
Female					
Male					
Female					
Female					
Male					

7. Using the screenshot of an Excel sheet below to write a formula that will evaluate the expression $\frac{A-B}{C+D}$ using the cell references where the values are in the sheet. (8 points)

	A	B	C	D	Formula
2					
3	A	B	C	D	Formula
4	13	16	13	8	
5					

8. A line graph shows the number of people in a sample of 856 that visited the mall the corresponding number of times. Based on the graph, how many mall trips to the largest number of people make? (5 points)

Number of People Making Number of Mall Trips
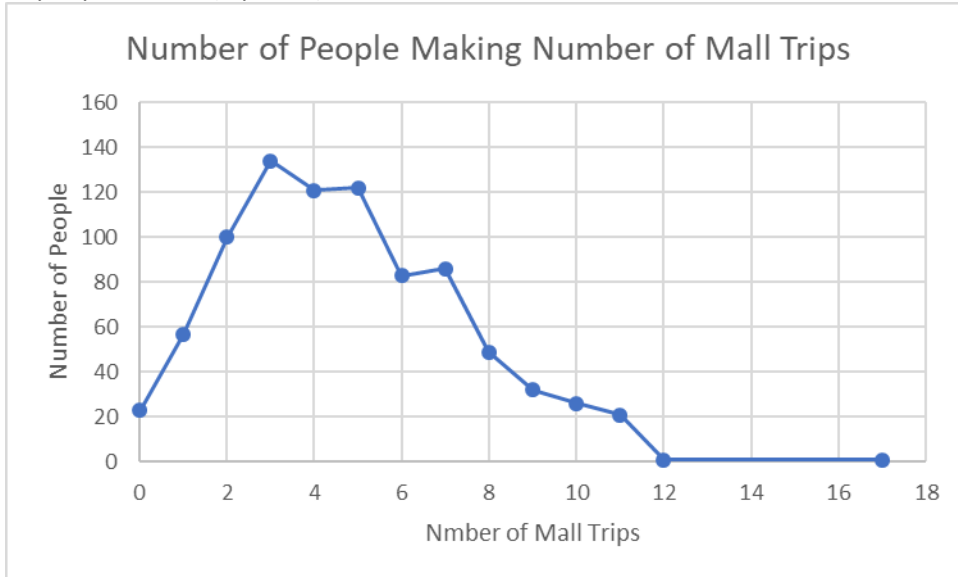
9. A pie chart of Age Groups appears below. Which age group is the smallest and which the largest in this data set? Report the corresponding percentages. (6 points)

PROPORTION BY AGE GROUPS

- 60-69 2%
- 50-59 14%
- 20-29 20%
- 40-49 28%
- 30-39 36%
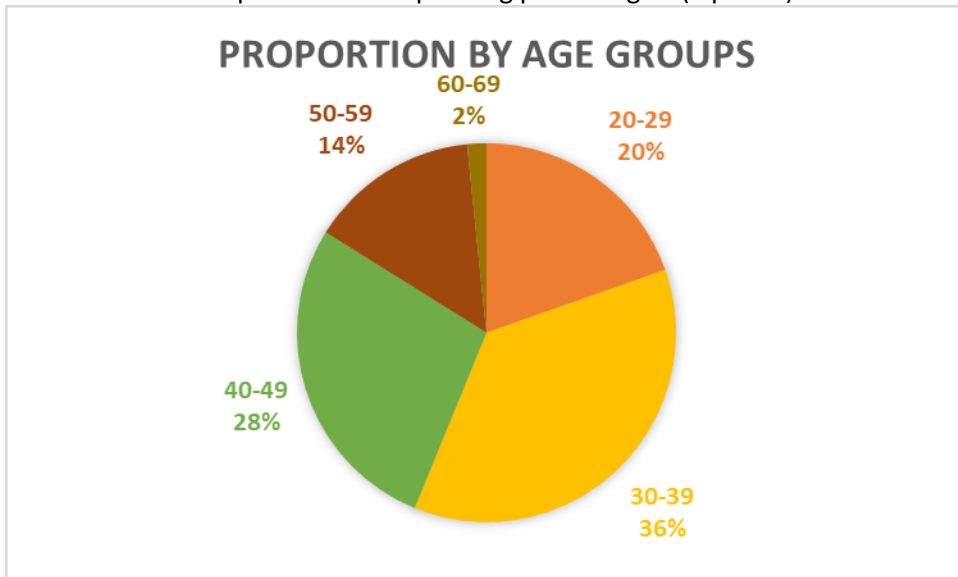
10. Below is a bar graph of who lives alone by type of home they dwell in. Is this a good graph?
    Why or why? Explain any positive features, and any negative features. (5 points)