

Instructions: This portion of the exam is based on the questions below using the Excel file **154exam1data.xlsx** and the questions below. The answers to these questions will be entered into the Canvas Exam #1 Part 1 as numerical, true/false, multiple choice or multiple answer type questions. This portion of the exam must be submitted electronically in Canvas and the computer will autograde the solutions.

After completing this exam, also submit you work and answers for Part 2 in the Part 2 submission folder. The second portion of the exam will be for written questions and submitted other types of Excel-related work such as graphs. The second part of the exam will be graded by hand. Both parts of the exam must be completed.

1. On Sheet 2, there is a table of values expressed in percent, decimal, fraction and scientific notation. Complete the table by filling in the missing formats so that each number appears in all four formats. **Copy the results below** (complete the table both here and in Excel). Be sure to express the fractions with denominators having at least three digits. (12 points)

Percents	Decimals	Fractions	Scientific Notation
0.06%	0.0006	$\frac{6}{100}$	6.01E-04
77.96%	0.7796	$\frac{191}{245}$	7.8E-01
8.48%	0.0848	$\frac{53}{625}$	8.48 E-02
62.4%	0.624	$\frac{78}{125}$	6.24 E-01

2. On Sheet 3, there is data on Pay Type and Gender. Create a Pivot Table of the data. **How many men are paid with salary?** (4 points)

269

3. On Sheet 4, is a list of salaries of a particular coal miner over a period of time in the 1940s and 1950s. Calculate the percent change in Column C for all the years after the first one. **Report below the percent from 1951 to 1952.** (4 points)

0.016946698

4. On Sheet 5 is data on credit card debt. **Find the 44th percentile of credit card debt and report the value below.** (4 points)

\$ 900

5. A loan of \$5000 is taken at a charge of 7.5% annual simple interest for 9 months. Find the amount of interest paid and the total amount of money to be paid back at the end of 9 months. (6 points)

$$5000 \left(1 + 0.075 \times \frac{9}{12}\right) = \$5281.25$$

6. Using an amortization table or a built-in financial formula in Excel, find the payment owed monthly on a mortgage of \$375,000 for 25 years at 2.75% annual interest compounded monthly. (6 points)

$$\$1,725.96$$

7. On Sheet 6, create a summary table of the data on Neighborhoods, and then create a pie graph of the data. Be sure that the percents are displayed on the graph and it has an appropriate title. Which neighborhood appears to have the fewest residents? What percent of the data is in this neighborhood? (6 points)

South, 24%

8. 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, $C = \{0, 2, 3, 6, 10\}$. Use this information to answer the questions that follow.
- a. How many values are in the universal set? (3 points)

11

- b. How many values are in set A? (3 points)

6

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

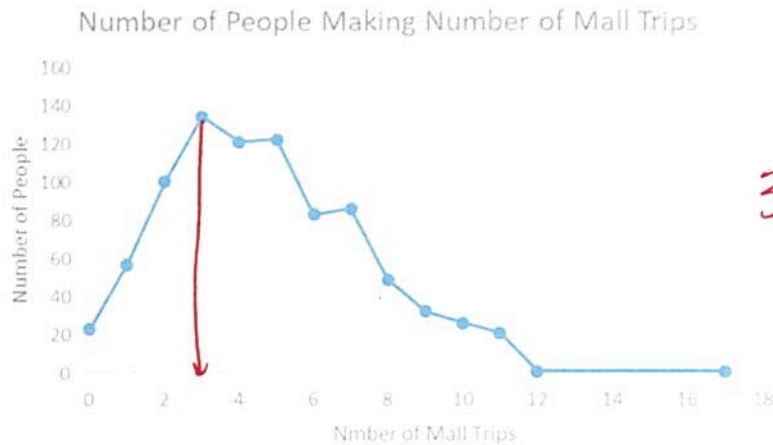
$$\frac{6}{11}$$

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

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

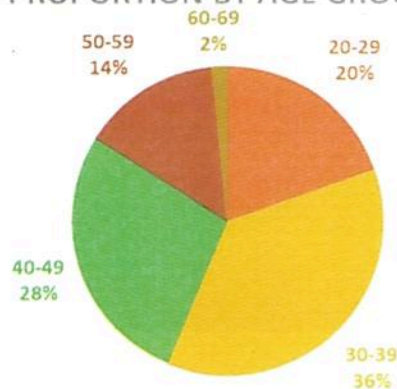
$$= (A4 + D4) / (C4 - B4) = -7$$

10. 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)



11. 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



Smallest 60-69
2%

largest 30-39
36%

Instructions: For this portion of the exam, answer the questions in words or by creating graphs or tables in Excel. You will be asked to submit your work (scan this portion of the exam or compile photo images of the pages in a single document), and you will be asked to submit your Excel work file. You will only be able to submit two files to the Canvas Exam #1 Part 2. Other than graphs and tables, you should write your answers out for any part that is listed in boldface. I will not search your Excel file for answers you are directed to answer on paper.

If you need data for the exam, use the same file as you used for Part 1: **154exam1data.xlsx**.

Academic Integrity Statement

I affirm that, I, _____ (student name), do attest that I alone am completing the problems on this test without receiving unauthorized assistance. I understand that violations of academic integrity may result in sanctions, up to and including expulsion from the college.

_____(Student Signature)

_____(Student ID number)

Attach a copy of your photo ID to the online submission (there is a question drop box for it). The ID must be a photo ID. A Driver's license, School ID (NOVA or otherwise), or a work ID are acceptable as long as it contains your full name and photo.

1. Using the data on Sheet 1, write an IF statement that determines if the value in Column A is greater than 30. The outputs of the IF statement should be 1 (TRUE) or 0 (FALSE), and then use a SUM formula to count the number of values that satisfy the condition. **Write your IF statement below that appears in cell B1, and the total number of values in the list that are greater than 30.** (4 points)

$=IF(A1 > 30, 1, 0)$

4

2. Determine if the sequence of values 6.5, 7.8, 9.1, 10.4, 11.7, 13, ... represents exponential growth. **If it does, state the common ratio. If it does not, explain why not.** (6 points)

*not exponential
no common ratio*

3. Make a comparative bar graph (cluster column graph) of the pivot table you made on Sheet 3. Be sure your graph is appropriately labeled and has a descriptive title. **Summarize what the table means.** (5 points)

The number of men and women paid hourly is about the same in this data, but more men are paid w/ salary

4. Using the data on Sheet 4, create a line graph of year and salary. Be sure that the graph is appropriately labeled. **Summarize in a sentence or two what the graph tells you.** (5 points)

Salaries have been increasing

Sometimes more quickly and sometimes more slowly

5. On Sheet 6, create a summary table of the data on Neighborhoods, and then create a pie graph of the data. Be sure that the percents are displayed on the graph and it has an appropriate title. (5 points)

6. 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, $C = \{0, 2, 3, 6, 10\}$. Use this information to answer the questions that follow.
- a. What is set C' (B-complement)? (3 points)

$$\{1, 4, 5, 7, 8, 9\}$$

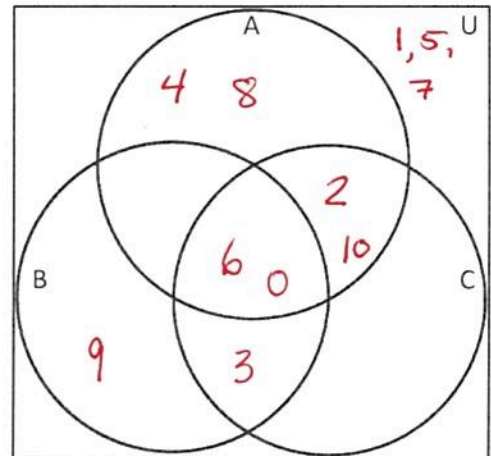
- b. What elements are in $A \cup B$? (3 points)

$$\{0, 2, 3, 4, 6, 8, 9, 10\}$$

- c. What elements are in $B \cap C$? (3 points)

$$\{0, 3, 6\}$$

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



7. Translate the logical notation below into English sentences if p is the statement "The TV is on", and q is the statement "The bread is in the oven". (4 points each)
- a. $\sim p$

The TV is not on

- b. $p \vee \sim q$

The TV is on or The bread is not in the oven

- c. $q \rightarrow p$

If the bread is in the oven, then the TV is on

- d. $p \wedge q$

The TV is on and the bread is in the oven

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

There exists a unique x such that $x^3 = 1$ (and x is real)

this statement is true

9. 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	

2.86652×10^{-7}

10. 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)

A woman who is 65.6" tall is taller than 70% of all women

11. 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						

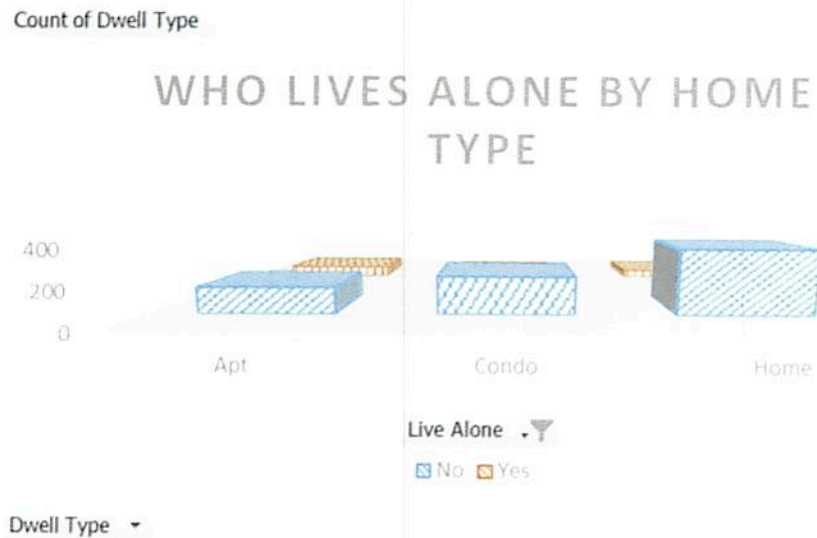
= IF (C2 = "Female", 1, 0)

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

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

$$= (A4 - D4) / (C4 - B4)$$

13. Below is a bar graph of who lives alone by type of home they dwell in. Is this a good graph? Why or why not? Explain any positive features, and any negative features. (5 points)



it is not. The 3D perspective makes it hard to read the short bars in the back
missing axis labels.

on the plus side, it does have a title