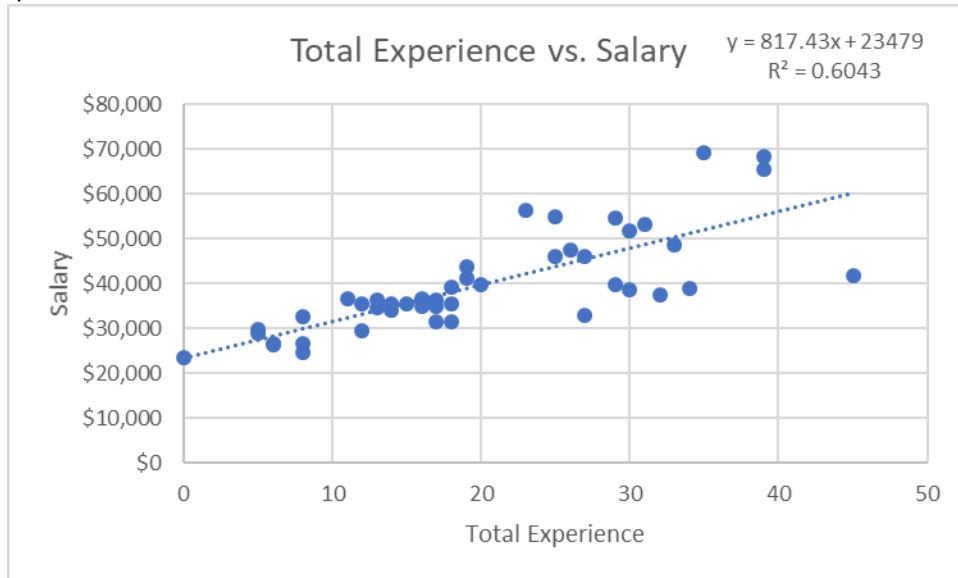


**Instructions:** This portion of the exam is to be answered entirely in class without Excel. You may use a calculator, but it may not be on a device that connects to the Internet. Round answers to two decimal places unless the question asks for a different number of places.

1. Employees are surveyed and a scatterplot of the relationship between total experience (work experience plus education) is plotted against salary. A linear regression line is found, and the equation and coefficient of determination is on the graph. Use this graph to answer the questions that follow.



- a. State the slope of the regression line and interpret it in the context of the problem. (5 points)
- b. State the y-intercept and interpret it in the context of the problem. (5 points)
- c. If a new employee has a total of 5 years of experience credits (one year on the job plus a 4-year degree), what kind of salary can they expect according to the regression line? (5 points)
- d. What is the proportion of the variability in salary that can be explained by total experience? (5 points)

2. What values are used to create a boxplot? (4 points)

3. A table of unit conversions is shown below. Use it to perform the following unit conversions. (4 points each)

**Length**

*SI unit : meter (m)*

- 1 km = 0.62137 mi
- 1 mi = 5280 ft  
= 1.6093 km
- 1 m = 1.0936 yd
- 1 in = 2.54 cm (exactly)
- 1 cm = 0.3937 in

**Temperature**

*SI unit : kelvin (K)*

- 0 K = -273.15°C
- = -459.67°F
- K = °C + 273.15
- °C =  $\frac{5}{9}(\text{°F} - 32^\circ)$
- °F =  $\frac{9}{5}\text{°C} + 32^\circ$

- a. Convert 927 kilometers to miles
- b. Convert  $-40^\circ\text{C}$  to degrees Fahrenheit

4. A screenshot below shows a small dataset, sample size 10. Based on the information shown, write the Excel formulas you'd need to calculate the requested values. (5 points each)

	AF	AG	AH	AI	AJ	AK
1		20				
2		22				
3		26				
4		23				
5		24				
6		18				
7		32				
8		24				
9		31				
10		28				
11						

- a. What formula would be needed to find the median of the data?
- b. What formula would be needed to find the 75<sup>th</sup> percentile?

5. Under what circumstances is it better to use a median as a measure of central tendency than the mean? (4 points)

6. Shown below is a pivot table of Gender, and whether or not the person lives alone. Use the table to answer the questions that follow. (5 points each)

	Column Labels		Grand
Row Labels	No	Yes	Total
Female	332	66	398
Male	379	79	458
<b>Grand Total</b>	<b>711</b>	<b>145</b>	<b>856</b>

a. If a person is randomly selected from the data, what is the probability that the person is female?

b. What is the probability that the person lives alone?

c. What is the probability that the person lives alone and is a woman?

d. What is the probability that the person lives alone or is a woman?

e. What is the probability that the person lives alone given that they are female?

7. Translate the logical and mathematical notation  $\exists x(x^2 = 1)$ . Then find the value of  $x$ . (6 points)

8. 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)

	U	V	W
1			
2			
3		3.17E-05	
4			

9. The 30<sup>th</sup> percentile of heights of men in the United States is approximately 68.2" or 5'8.2". What does this statement mean in plain English? (5 points)

10. Using the screenshot of an Excel sheet below to write a formula that will evaluate the expression  $\frac{A-B^2}{C+\sqrt{D}}$  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					

11. Explain why the graph below is a bad graph. There are at least two problems with it. (8 points)

