Frequently Asked Questions

This document will be updated until ***August 31st***, after which there will be no further assistance available. If your question has not been answered in this document, try rereading the instructions, viewing the online resources and looking over the rubric. Until then, if you don't see your question answered here, please email Connor at cab26@queensu.ca.

It is recommended that for formatting requirements, you read the **formatting section** of the assignment, and use the **pdf tutorials** & **practice assignment answer key** as examples. The videos will help show you how to do things, but these are the most updated resources for the formatting requirements.

!Please note! **DUE TO AN UPDATE IN THE ASSIGNMENT, EQUATION 3 HAS BECOME EQUATION 4. THE CURRENT DOCUMENT REFLECTS THIS, BUT ANY QUESTIONS EMAILED BEFORE AUGUST 9th PERTAINING TO EQUATION 4 WILL HAVE CALLED IT EQUATION 3. SORRY FOR THE CONFUSION.**

DIRECTORY

General Questions 3
- Finding the Excel Word Assignment & Tutorials 3
- Submitting the Excel Word Assignment 3
- Determining Significant Figures 3
- Performing Calculations 3
- Trendline Equations 3
- Downloading Analysis ToolPak for Mac 3
- Basic Plot Guidelines 3
- Formatting Equations 4
- Digits for Calculations 4

Question 1 4
- Error Bars 4
- Ln Uncertainty 4
- Use of Equation 2 4
- Steps to Follow 9 5

Question 2 5
- Reading the Regression Analysis Results 5
- Finding k 5

General Questions

Finding the Excel Word Assignment & Tutorials

The assignment, the practice assignment and tutorials for Microsoft Excel and Word can be found HERE.

Submitting the Excel Word Assignment

The instructions for submitting the Excel Word Assignment will be provided a **week before the due date**.

Determining Significant Figures

Error should be reported to **1 significant figure.** If there is a number that has an error value associated with it, it should be reported to the **same digit** as the error.

Examples: 678 ± 16 should be expressed as $(6.8 \pm 0.2) \times 10^2$ or $(68 \pm 2) \times 10^1$

987.54 ± 0.11 should be expressed as 987.5 ± 0.1

If there is **not an error value associated** with a given value, and the number of significant figures has not been specified in the question, report all numerical values to **two decimal places**

Performing Calculations

When performing calculations, use as many significant figures as the numbers are **presented with**. If you are using the equations or the values from the regression analyses, you must use the numbers as they are presented **with error** because that is the only digits that can be guaranteed.

Trendline Equations

Trendline equations should always be included **whenever a trendline is included on a plot**. The trendline equations should be presented on the plot with their trendlines and should also have the R^2 value on the plot.

Downloading Analysis ToolPak for Mac

Go to the ***Tools*** drop down menu and select Add-Ins. From there, you should see the option to check off both or either of the Analysis ToolPak or Solver.

Basic Plot Guidelines

Figure 1 below was taken from the practice assignment answer key in order to help you see what a good plot should look like. Some things to note:

- No gridlines, use inside tick marks instead
- Axis titles with units but no chart titles
- Legend is enclosed by the plot, but not overlapping any data
- Plot enclosed by a black box – plot area line and axis are black lines
- Trendline equations and R^2 values present on the graph, with variables & subscripts to show what trendline they are attached to
    - You may also choose to add a line to the label to show what series they work with
- Descriptive Figure caption

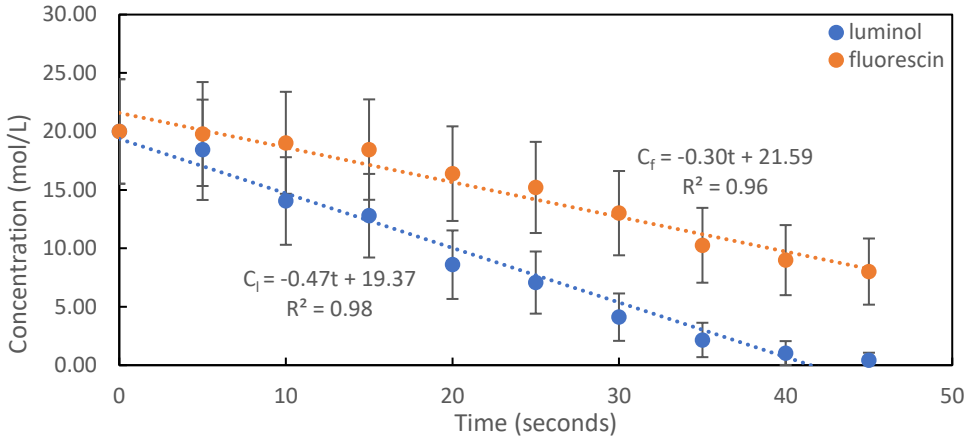

Figure 1: Example plot for formatting purposes

Formatting Equations

Start by creating a table with three cells, as shown below

Write your equation in the center cell and the number in the right cell. It may also help to copy the number into the left cell and make the font white.

	$y = mx + b$	(1)

Then make the table lines white/invisible, and you'll have an equation that looks like below

$$y = mx + b \quad (1)$$

Digits for Calculations

You should be using the number of digits dictated by error in your calculations. If the number has no error associated, use all the digits provided by the trendline. If the number has error associated with it, only use the same number of digits that are presented with the error. For example, if a value is given as 5.274 ± 0.1, then you can only use 5.3 in calculations.

Question 1

Error Bars

Error bars should only be in the y-direction. We know the number of rides exactly, so there should be no error bars in the x-direction. Ensure you set the x-direction to 0 and remove the caps so they can't be seen.

Ln Uncertainty

To calculate the ln uncertainty, simply take the ln of the previously calculated uncertainty values.

Use of Equation 2

When determining the cost of each of the rides in table 2, the building cost may be included as part of the intercept. This may help you envision total costs of the rides. You may also choose to simply add the building costs after the maintenance costs have been calculated. It may also be helpful to present the equation in your document, subbing out m for the slope and b for the intercept, while defining a variable

for initial cost. This would help the reader see what equation is being used in the calculations you show and do not show clearly.

Steps to Follow 9

The descriptive statistics tool is used to determine the mean and standard error of a particular set of data. Be sure you're using it on the average maintenance cost data that you calculated from the average of rides 1,2 & 3.

Question 2

Reading the Regression Analysis Results

You'll see a table like Table 1 below when you perform a regression analysis. The intercept is your b value and the x variable 1 is the slope m. The numbers are under the *Coefficients* column and the standard error is the error associated with these values.

Table 1: An example of the regression analysis table to look for

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	4.570462101	0.014864758	307.4696598	3.7448E-266
X Variable 1	-5.29891E-10	6.10319E-12	-86.8220128	5.6356E-159

Finding k

You will need the rate constant k in order to complete steps to follow 11. Interestingly enough, it's hidden in the calculations you've done up to this point. Where is it? I can't tell you, but I can provide some hints. You'll need equation 4 for the half-life calculation. Equation 4 has been included below.

$$P(t) = e^{-kt}$$

Okay great, now we need to rearrange for t, right? So let's take the natural logarithm of both sides, shall we?

$$\ln\big(P(t)\big) = -kt$$

Okay, now that's easy to rearrange. But that doesn't really help us in finding k. What if there is some parent remaining at t = 0? Let's add on the original amount of parent, shall we?

$$\ln\big(P(t)\big) = -kt + \ln(N_0)$$

Hmm, that format of equation looks kinda familiar, eh?

That's all ya get y'all! Hope that helps.