**Logo

Description automatically generated San Francisco Bay University**

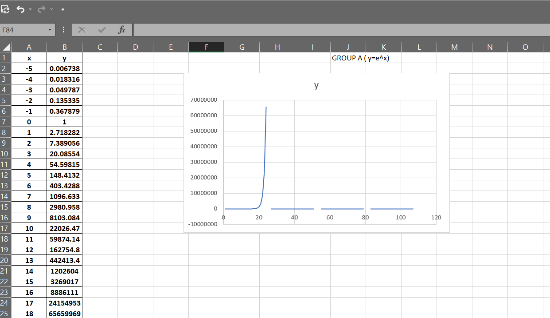
**MATH201 - Calculus-I**

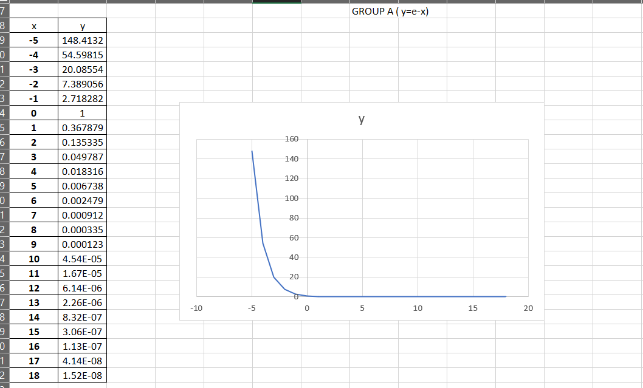
**Homework Assignment #2**

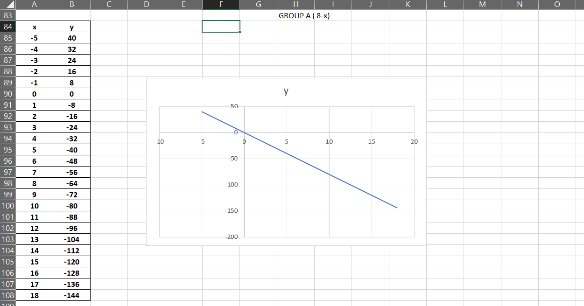
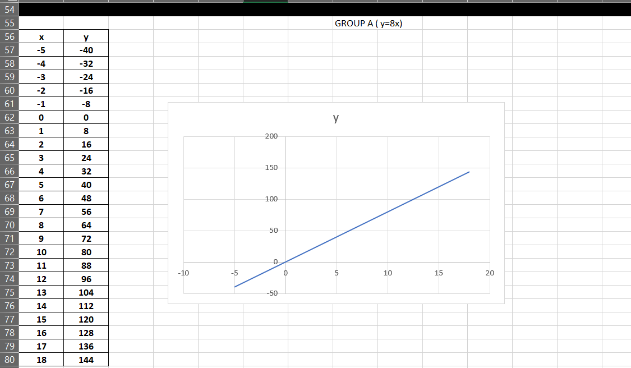
**Due day: 6/10/2023**

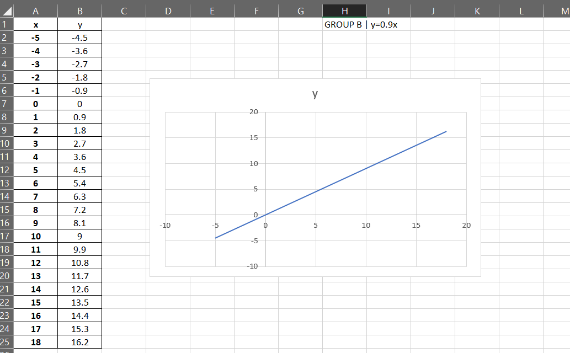
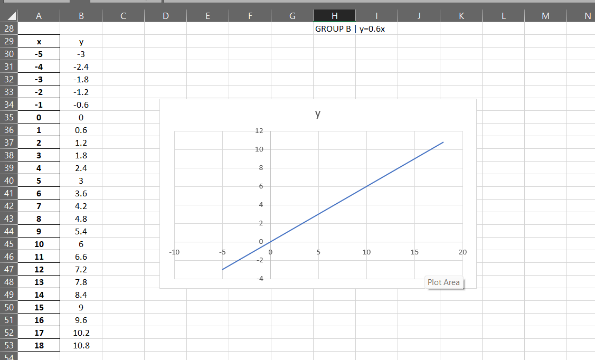
**Instruction:**

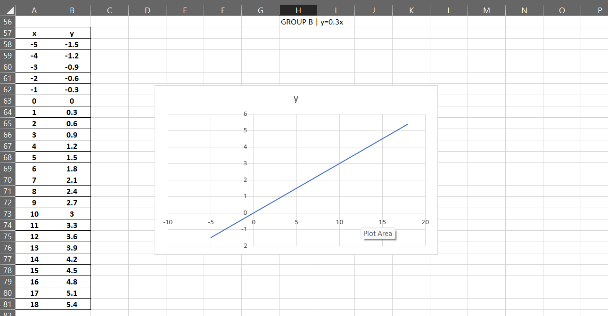
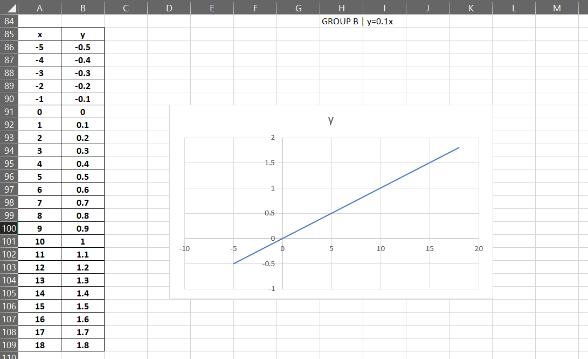
1. **Push the answer sheet to Github in word file**
2. **Overdue homework submission could not be accepted.**
3. **Takes academic honesty and integrity seriously (Zero Tolerance of Cheating & Plagiarism)**
4. Plot each following group of functions in one graph respectively by **Excel**, covering the appropriate domain of *x* and *y.*











1. Given , prove that and verify it by the plot in **Excel.**

Given: f(x) = 10^x

To prove: (f(x+h)-f(x))/h = 10^x ((10^h-1)/h)

Proof:

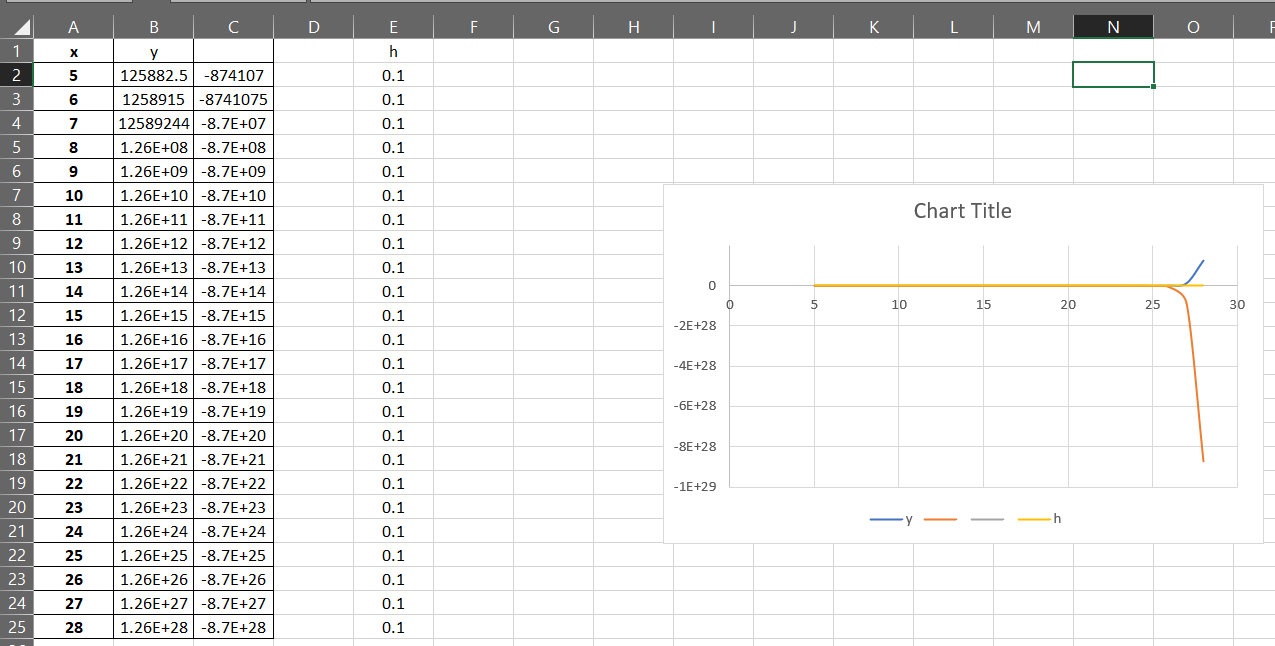
f(x+h) = 10^(x+h)

f(x) = 10^x

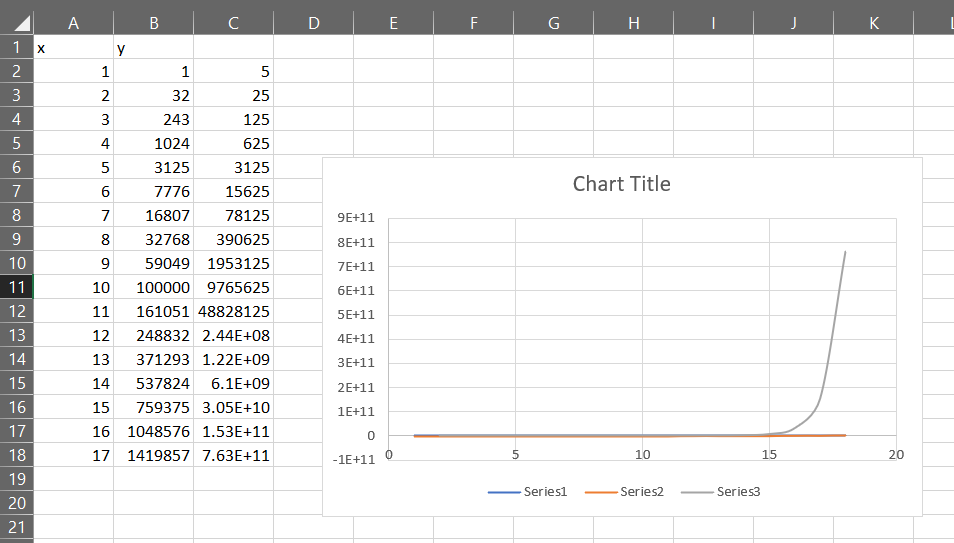
(f(x+h)-f(x))/h = (10^(x+h)-10^x)/h

(10^(x+h)-10^x)/h = 10^x (10^h-1)/h

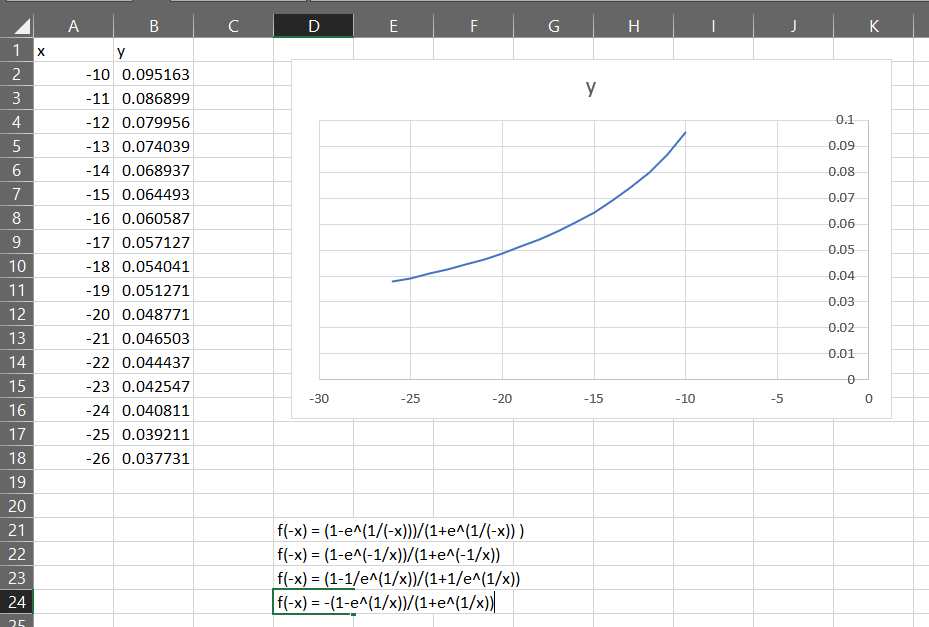
Therefore, (f(x+h)-f(x))/h = 10^x ((10^h-1)/h)



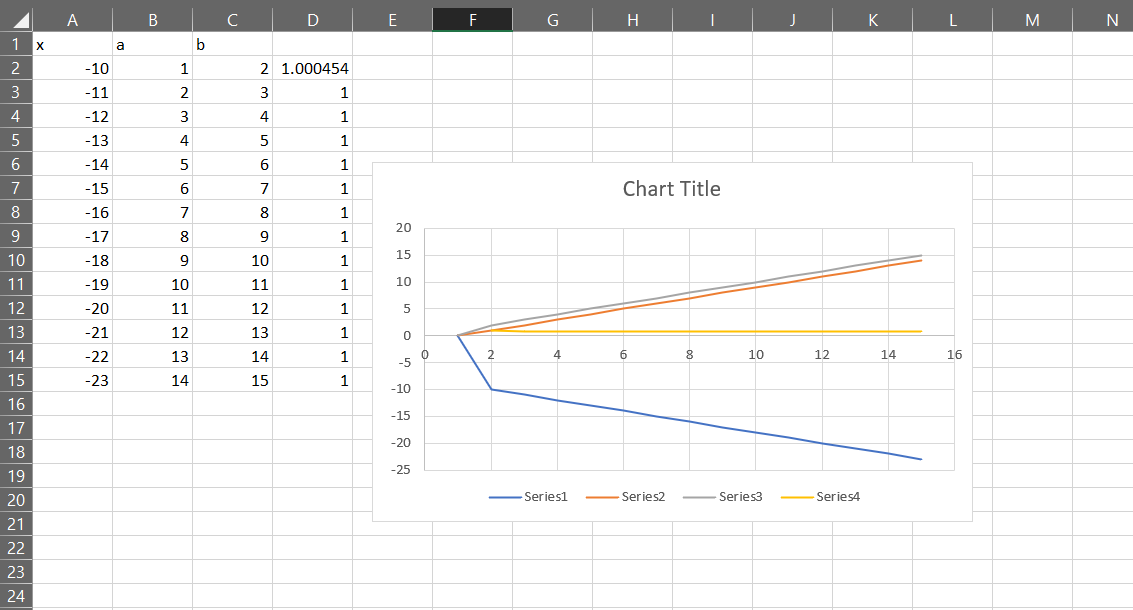
1. Compare the functions and by plotting curve in **Excel** and which function grows more rapidly when *x* is large? And prove it mathematically.



1. Plot the function in **Excel**. And then prove that is an odd function.



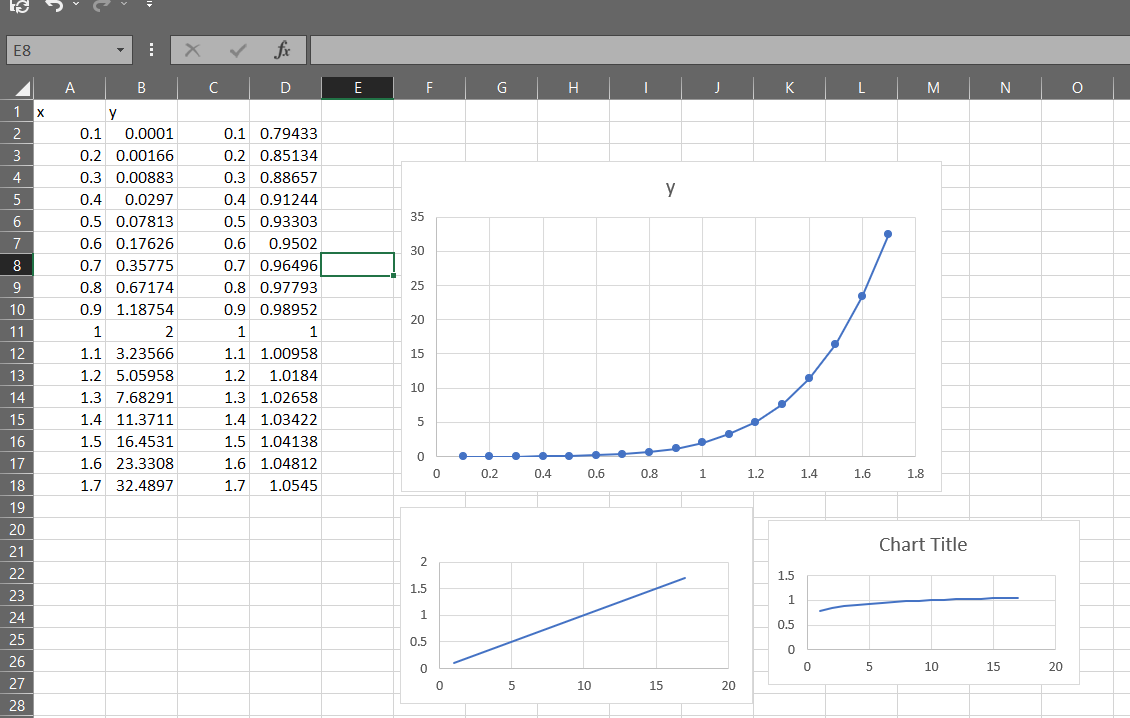
1. For the parametrized function
   1. where a > 0. How does the graph change when b changes by showing a group of curves by **Excel**?



* 1. How does it change when *a* changes in **Excel**?

When a increases the f(x) decreases because the denominator is decreasing as well.

1. If , find expression. And that, plot and in one graph by **Excel**



1. When a camera flash goes off, the batteries immediately begin to recharge the flash’s capacitor, which stores electric charge given by

(The maximum charge capacity is and t is measured in seconds.)

* 1. Find the inverse of this function and explain its meaning.

The inverse of this function is t= -a ln(1-y/Qo)

This is the amount of time it takes for the capacitor to change.

* 1. How long does it take to recharge the capacitor to 90% of capacity if a = 2 showing in the plot by **Excel**?

