Fourier Synthesis

1. Notice that this report only requires the **excel file**.
2. You need to start the lab by doing the sample given in Figure 5.
3. Refer to the uncertainty lab (lab 1) to review how to generate the X values. Please remember that the x-values must be in **radians** and **equally divided**.
4. For the two exercises you need 257 x values, starting with zero.
5. I have included in the website two PDF files that show the derivation of the Fourier Transform for the Square and the Sawtooth waves.
6. Notice that in both cases the $\mathbf{a_n}$ coefficient is **zero**. Therefore, we will only be using the **sine function** part of the Fourier series.
7. Refer to the analysis lab to review how to include the amplitude and the harmonic numbers (frequency) in the sine function equation
8. For the square wave the values of n are odd. Therefore, the harmonic numbers will be odd values. Example n = 1, 3, 5,…
9. The function for the square wave is equals to **1/n * sin(n*x)**
10. For the Sawtooth wave the values of harmonic numbers, n, are 1, 2, 3…
11. The function for the Sawtooth function is **1/n * sin (n*x)**
12. Do at least **20 harmonics** for each function.
13. The **amplitude** of each function is equal to **1/n**.
14. Your last column should have the sum of the sine values for each harmonic.
15. You will graph the sum column in the y-axis and the x values in the x-axis.
16. Select **line** as your type chart.