1. Use Lagrange's method to determine y at x=2 in the following dataset

x = [1, 3, 5]
y = [3, 10, 20]

2. Consider the dataset

x = [0, 1, 2, …, 10]

y = (x*(1+0.1*random))^2

where the 'random' number is generated randomly between 0 to 1 for each point x. Obtain the fitting functions with m=1, m=2, m=3 order polynomials and their corresponding standard deviation.

3. Find the fit to the following dataset with the log of an exponential form

$$\ln(ae^{bx}) = \ln a + bx$$

x = [1.2, 2.8, 4.3, 5.4, 6.8, 7.9]
ln(y) = [2, 3, 3.5, 4, 5, 5.6]

Compare the resulting fitting coefficients and standard deviation when

a) The weights $W_i = 1$
b) The weights $W_i = y_i$