Holy Spirit University of Kaslik
Faculty of Sciences
Department of Mathematics

Nom :

Matricule :

MAT418 - Numerical Methods
Spring - 2019/2020
Assignment 2 - May 04
Duration: - 35 mn

* Calculator non programmable is authorized

Instructor: Dr. Grace EL KHOURY

Question 1 :

Here are the points $(-1,2),(0,1),(2,0)$.

1. Use Lagrange interpolation to find a polynomial of degree 2 or less whose graph passes through these points.
2. Find Newton polynomial that passes through these points.
3. Is it the same polynomial as the previous one? Justify theoretically your answer.
4. How many polynomials of each degree $d = 1, 2, 3, 4, 5$ pass through these points. Give an example of each degree when a polynomial exists.
5. Use a convenient method to find the polynomial $Q(x)$ of degree 3 or less whose graph passes through the points $(-1,2),(0,1),(2,0),(2.5,1)$.

Question 2 :

The aim of this exercise is to adjust by the least squares method, a cloud of n points (x_i, y_i) using the function hereunder:

$$y = ae^{bx}.$$

1. Develop the method that allows to determine the parameters a and b.
2. Find a and b for the following cloud of points:

x_i	0.2	0.4	0.5
y_i	4	6	8