
1. Type your answers in a **Microsoft Word** file and **name** the file in the following format:

Assignment3_SID_LastName_FirstName.

2. **Annotate** all your answers in your submission using the following **format**: #

Answer to Question X

3. Type **your name** and **student ID** on top of the **answer sheet**.

4. Submit your work in **Canvas** before the **deadline**.

5. Write down all your steps.

Question 1

Find the coefficients of the Newton's interpolation model for the data in the table below.

5 marks

x_i	y_i
1	0
2	0.69
3	1.10
4	1.39
5	1.61

Answer:

$$b_1 = f[x_0, x_1] = 0.69$$

$$f[x_1, x_2] = 0.41$$

$$f[x_2, x_3] = 0.29$$

$$f[x_3, x_4] = 0.22$$

$$b_2 = f[x_0, x_1, x_2] = -0.14$$

$$f[x_1, x_2, x_3] = -0.06$$

$$f[x_2, x_3, x_4] = -0.035$$

$$b_3 = f[x_0, x_1, x_2, x_3] = 0.0267$$

$$f[x_1, x_2, x_3, x_4] = 0.0083$$

$$b_4 = f[x_0, x_1, x_2, x_3, x_4] = -0.0046$$

Question 2

Compute the first six iterations of the false-position method to find the root of the function $f(x) = 2x^3 - 2x^2 + x - 4$. Start with $x_l = -2$ and $x_u = 2$. Complete the table below.

5 marks

Iteration	x_l	x_r	x_u	$f(x_l)$	$f(x_r)$	$f(x_u)$	ϵ
1	-2	1.3333	2	-30	-1.4815	6	-
2							
3							
4							
5							
6							

Iteration	x_l	x_r	x_u	$f(x_l)$	$f(x_r)$	$f(x_u)$	ϵ
1	-2	1.3333	2	-30	-1.4815	6	-
2	1.3333	1.4653	2	-1.4815	-0.53620	6	9.009
3	1.4653	1.5092	2	-0.5362	-0.1711	6	2.9063
4	1.5092	1.5228	2	-0.1711	-0.0524	6	0.8937
5	1.5228	1.5269	2	-0.0524	-0.0158	6	0.2704
6	1.5269	1.5282	2	-0.0158	-0.0048	6	0.0814