

NPTEL lectures on
Elementary Numerical Analysis

by

Professor Rekha P. Kulkarni

Department of Mathematics

Indian Institute of Technology Bombay

Assignment 2

1. Find a quadratic polynomial $p_2(x)$ such that

$$p_2(-1) = 2, p_2(0) = 1, p_2(1) = 3.$$

2. Find a cubic polynomial $p_3(x)$ such that

$$p_3(-2) = -1, p_3(-1) = 3, p_3(1) = -1, p_3(3) = 19.$$

3. The following data is taken from a polynomial of degree 4. Form a divided-difference table and find $p(5)$.

x	0	1	2	3	4
p(x)	1	5	31	121	341

4. Let p be a polynomial of degree ≤ 2 and x_0, x_1 and x_2 be distinct points. Show that the divided difference $p[x_0, x_1, x_2]$ is independent of x_0, x_1, x_2 .
5. Let p be a polynomial of degree $< k$ and x_0, x_1, \dots, x_k be distinct points. Show that the divided difference $p[x_0, x_1, \dots, x_k]$ is equal to 0.