

**Numerical Analysis Semester 081 Problem Set 7**

**Reference: Chapter 05.02 Newton Divided Difference Method**

**For these problems show all work by hand**

1a) Construct the Newton divided-difference table for the following tabulated data points:

$k$	$x_k$	$f(x_k)$
0	1.0	3.60
1	3.0	1.80
2	5.0	1.20
3	7.0	0.90

b) Write down the Newton Polynomials of degree one, two and three interpolating these points:

2. Consider the tabulated function values for the function  $f(x) = 3 \sin^2(\pi x/6)$ :

$k$	$x_k$	$f(x_k)$
0	0.0	0
1	1.0	0.75
2	2.0	2.25
3	3.0	3.00
4	4.9	2.25

a) Construct the divided-difference table.

b) Write down the Newton polynomials of degree 1, 2, 3, and 4

c) Evaluate each of the above Newton polynomials at 1.5 and at 3.5

d) Compare these values to the actual function values at those points.