

Home Assignment (Set – 01)
Numerical Methods
Paper Code : Core – 4.1
B.A. / B.Sc. 4th Semester (Honours)

1. If $y = x^3 + x^2 - 1$, calculate the values of y for $x = 0, 1, 2, 3, 4$ and construct the difference table.

2. Construct a forward difference table from the following values x and y

x :	5	10	15	20	25
y :	996	983	970	959	952

3. Construct a forward difference table, given that

x :	5	10	15	20	25	30
y :	9962	9848	9659	9397	9063	8660

4. Construct a forward difference table and find the 5th term of the series :

3, 6, 11, 18

5. Construct a forward difference table and find the 6th & 7th terms of the series :

0, 4, 16, 42, 88

6. Construct a backward difference table from the following values x and y

x :	15	20	25	30	35
y :	4025	5023	6018	7005	7089

7. Construct a backward difference table with the following data :

$u_0 = 30, \quad u_1 = 140, \quad u_2 = 870, \quad u_3 = 2230, \quad u_4 = 5290$

8. Evaluate the following problems (h being the interval of differencing) :

(a) $\Delta \tan^{-1} ax$

(b) $\Delta \sin 3x \cos x$

(c) $\Delta \cosh ax$

(d) $\Delta \cot a^x$

9. Evaluate the following problems (h being the interval of differencing and $h = 1$) :

(a) $\Delta^2(ab^x)$

(b) $\Delta^3[(1 - x)(1 - 2x)(1 - 3x)]$

(c) $\Delta^9[(1 - ax^2)(1 - bx^3)(1 - cx^4)]$

10. Prove that

$$e^x = \left(\frac{\Delta^2}{E}\right) e^x \cdot \frac{Ee^x}{\Delta^2 e^x}$$

the interval of differencing being unity (i.e., put $h = 1$)

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