



Subject: Numerical Methods and Algebra

Chapter: Error, Dimensions and Interpolation

Category: Home-Work

Home work-1 : Lagranges's Interpolation

1. The function $y=f(x)$ is given by the points (7,3), (8,1), (9,1) and (10,9). Find the value of y at $x=9.5$ using Lagrange's interpolation formula.
2. The observed values of a function are respectively 168, 120, 72, and 63 at the four positions 3, 7, 9 and 10 of the independent variable. Find the best estimate of the function at the position 6 of the independent variable.
3. Following are the values of the function $f(x)$ for values of $x= 1, 2, 7$

$$f(1)= 4, f(2)=5, f(7)=5, f(8)=4$$

Find the value of $f(6)$ using Lagrange's interpolation formula.

4. Apply Lagrange's interpolation formula to find $f(5)$ given that $f(1)=2$, $f(2)=4$, $f(3)= 8$, $f(4)=16$ and $f(7)=128$.

5. Apply Lagrange's formula to find $f(15)$ using the following values of the function $f(x)$

$X=$	10	20	14	16
$f(x)=$	0.25	0.2	0.15	0.10

Home work-2 : Regula Falsi Method

Using false position method, find the approximate values of the root of the equation:

1. $X^3+x-1=0$ lying between 0.5 and 1
2. $X^3-2x+0.5=0$ lying between 0 and 1
3. $X^3+2x-20=0$ lying between 2 and 2.5
4. $3x-\cos x-1=0$ lying between 0 and 1
5. X^3-3x-5 lying between 2 and 2.5
6. $x \log_{10} x - 1.2 = 0$ lying between 2 and 3
7. $X^3-4x+1=0$
8. $X^3+2x^2-8=0$
9. $X^3-9x+1=0$
10. $X^3-x-4=0$