**Lab Experiment no. 4**

**Numerical Differentiation (Three Point and Five Point Formulas)**

**&**

**Numerical Integration (Trapezoidal & Simpson's Rule)**

Numerical Differentiation

Matlab Code

clc

format long

a=input('enter the function in term of x (hint: use dot befor any math operation) :','s');

f=inline(a)

p=input('Enter the point: ');

h=input('Enter the distance between the points:')

x=[(p-2\*h) (p-h) p (p+h) (p+2\*h)]

Fx=f(x)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%z=1\*h;

i=input('choose a method to solve: \n 1.Three point End-point \n 2.three mid-point \n 3.fivepoint mid-point \n:');

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%x0=3;

if i==1

Fdx=(1/(2\*h))\*(-3\*f(p)+4\*f(p+h)-f(p+2\*h));

elseif i==2

Fdx=(1/(2\*h))\*(f(p+h)-f(p-h));

elseif i==3

Fdx=(1/(12\*h))\*(f(p-2\*h)-8\*f(p-h)+8\*f(p+h)-f(p+2\*h));

end

Fdx

Numerical Integration

Matlab Code

clc

format long

syms x

z=input('enter the function in term of x (hint: use dot before any math operation) :','s');

f=inline(z)

a=input('Enter the point 1: ');

b=input('Enter the point 2: ');

hT=b-a

hS=((b-a)/2)+a

x=[a hS b]

disp('Tripezoidal\n:')

FX=(hT/2)\*(f(a)+f(b))

disp('Simpson\n:')

FX=(hS/3)\*(f(a)+4\*f(hS)+f(b))