1. (a) Draw the line plot of the functions :  and , for x=0 : 5\*pi, with step of pi/20 in the same figure.

(b) Use edit mode in Sec. 9.4.1 to insert the x-label, y-label, title, and legend. All of the text can be defined by yourself.

(c) Use the Figure properties editor (refer to the sec. 9.4.2) to change at least three line properties (like color, line style, etc.).

(d) Use the handle of the graphic object to do the same things in (c).

1. (a) To plot the surface of the following function:

 over the grid defined by

−2 ≤ *x* ≤ 2*,* −4 ≤ *y* ≤ 4*,* where the grid step is 0.1 in both directions.

1. (a) Write a script newquot.m which uses the Newton quotient [*f (x* + *h)* −*f (x)*]*/h* to estimate the first derivative of *f (x)*. using small values of . .

(b) Rewrite newquot as a function M-file able to take a handle for f (x) and x value as an input argument, where x=-5 : 5 , with step of 0.1.. And the output argument is the first derivative values of *f (x)*.

1. Instead of ‘white loop’ by using (for & if break). (hint: the script is to implement the newton’s method in book (sec. 7.1 p. 164)),

steps = 0; % iteration counter

x = input( 'Initial guess: '); % estimate of root

re = 1e-8; % required relative error

myrel = 1;

while myrel > re & (steps < 20)

xold = x;

x = x - f(x)/df(x);

steps = steps + 1;

disp( [x f(x)] )

myrel = abs((x-xold)/x);

end

if myrel <= re

disp( 'Zero found at' )

disp( x )

else

disp( 'Zero NOT found')

end

Answer of problem 1:

clear all;close all;

x = 0:pi/20:4\*pi;

plot(x,exp(-0.2\*x).\*sin(2\*x),'--\*r')

hold on

plot(x,exp(-0.1\*x).\*cos(4\*x),'--ob')

hold off

hkids=get(gca,'child'); % get the object handles of the child of the figure

set(hkids(1),'marker','\*') %set the line property of the line 1

hkids(1).Marker='o';

hkids(2).LineStyle='-';

hkids(2).LineWidth=2.0;



Answer of problem 2:

clear all;close all;

[x, y] = meshgrid(-2:0.1:2,-4:0.1:4);

z = 20\*y.^2 .\* exp(-x.^2 - (0.5.\*y.^2));

figure, surface(x,y,z);



Answer of problem 3:

fn1 = @(x) x.^3+2\*x.^2+5\*x-4;

fplot(fn1,[-5 5])

x=-5:0.05:5;

df1=newquot\_handel(fn1,x);

figure(11);plot(x,df1)

% Function file newquot\_handel.m

function df=newquot\_handel(fn,x)

h = 10e-3;

df = (feval(fn, x + h) - feval(fn, x)) ./ h;



Answer of problem 4:

% excludes zero roots!

steps = 0; % iteration counter

x = input( 'Initial guess: '); % estimate of root

re = 1e-8; % required relative error

myrel = 1;

for steps=1:19

xold = x;

x = x - f(x)/df(x);

steps = steps + 1;

disp( [x f(x)] )

myrel = abs((x-xold)/x);

if myrel <= re

break;

end

end

if myrel <= re

disp( 'Zero found at' )

disp( x )

else

disp( 'Zero NOT found')

end