***ABDUL MOIZ BIN MEHMOOD SP14-BPH-032***

***%%%Q.1***

clear variables

close all

clc

mefunky= @(x) exp(-x)-x; % ze function

x\_lower=0;

x\_upper=1;

x\_mid= (x\_lower + x\_upper)/2;

chakarum=0;

if mefunky(x\_lower)\*mefunky(x\_upper) > 0 %chk if root exists in the interval

error ('Interval Error, The world will end now because of your stupidity!')

else

while abs(mefunky(x\_mid))> 10^-6 %le me bisecting

if (mefunky(x\_mid)\*mefunky(x\_lower)) <= 0

x\_upper=x\_mid;

else

x\_lower=x\_mid;

end

x\_mid = (x\_lower + x\_upper)/2;

chakarum= chakarum +1;

end

end

%le me giving answer

result = ['The root is found to be at, x = ',num2str(x\_mid),...

' & y = ',num2str(mefunky(x\_mid)),' after, n= ',num2str(chakarum),' iteration(s)'];

disp(result)

***%%%Q.2***

clear variables

close all

clc

mefunky= @(x) exp(-x)-x; % ze function

x\_range = [0 1]; % initial interval

options = optimset('Display','off'); %iterations, n

[x fval exitflag output] = fzero(mefunky,x\_range,options);

n = output.iterations;

%le me giving answer

result = ['Using fzero ftn. the root is found to be at, x = ',num2str(x),...

' & y = ',num2str(mefunky(x)),' after, n = ',num2str(n),' iteration(s)'];

disp(result)

***%%%Q.3***

clear variables

close all

clc

mefunky= @(x) 9\*x.^4 + 18\*x.^3 - 38\*x.^2 + 57\*x.^2 - 14 ; % ze function

x\_lower=0;

x\_upper=1;

x\_mid= (x\_lower\*mefunky(x\_upper) - x\_upper\*mefunky(x\_lower))/(mefunky(x\_upper)- mefunky(x\_lower));

chakarum=0;

if mefunky(x\_lower)\*mefunky(x\_upper) > 0

error ('Interval Error, The world will end now because of your stupidity!')

else

while abs(mefunky(x\_mid))> 10^-6 %le me bisecting

if (mefunky(x\_mid)\*mefunky(x\_lower)) <= 0

x\_upper=x\_mid;

else

x\_lower=x\_mid;

end

x\_mid = (x\_lower\*mefunky(x\_upper) - x\_upper\*mefunky(x\_lower))/(mefunky(x\_upper)- mefunky(x\_lower));

chakarum= chakarum +1;

end

end

%le me giving answer

result = ['The root is found to be at, x = ',num2str(x\_mid),...

' & y = ',num2str(mefunky(x\_mid)),' after, n= ',num2str(chakarum),' iteration(s)'];

disp(result)

***%%%Q.4A***

clear variables

close all

clc

funk\_2= @(x) x.^2;

funk\_1= @(x) x.^3 - 2\*x +1;

mefunky= @(x) funk\_1(x) - funk\_2(x); % ze function

%The reason this works, is that you are looking for pairs (x,y)

%that satisfy both equations simultaneously, so to ensure the y-coordinates

%are the same,implies that funk\_1(x)=funk\_2(x) = mefunky(x). Hence their

%difference should == 0 for a certain value of x, hence root of mefunky(x)

x\_lower=0;

x\_upper=1;

x\_mid= (x\_lower + x\_upper)/2;

chakarum=0;

if mefunky(x\_lower)\*mefunky(x\_upper) > 0 %chk if root exists in the interval

error ('Interval Error, The world will end now because of your stupidity!')

else

while abs(mefunky(x\_mid))> 10^-6 %le me bisecting

if (mefunky(x\_mid)\*mefunky(x\_lower)) <= 0

x\_upper=x\_mid;

else

x\_lower=x\_mid;

end

x\_mid = (x\_lower + x\_upper)/2;

chakarum= chakarum +1;

end

end

%le me giving answer

result = ['The intersection is found to be at, x = ',num2str(x\_mid),...

' & y = ',num2str(funk\_1(x\_mid)),' after, n= ',num2str(chakarum),' iteration(s)'];

disp(result)

***%%%Q.4B***

clear variables

close all

clc

funk\_2= @(x) x.^2;

funk\_1= @(x) x.^3 - 2\*x +1;

mefunky= @(x) funk\_1(x) - funk\_2(x); % ze function

%The reason this works, is that you are looking for pairs (x,y)

%that satisfy both equations simultaneously, so to ensure the y-coordinates

%are the same,implies that funk\_1(x)=funk\_2(x) = mefunky(x). Hence their

%difference should == 0 for a certain value of x, hence root of mefunky(x)

x\_lower=0;

x\_upper=1;

x\_mid= (x\_lower\*mefunky(x\_upper) - x\_upper\*mefunky(x\_lower))/(mefunky(x\_upper)- mefunky(x\_lower));

chakarum=0;

if mefunky(x\_lower)\*mefunky(x\_upper) > 0

error ('Interval Error, The world will end now because of your stupidity!')

else

while abs(mefunky(x\_mid))> 10^-6 %le me bisecting

if (mefunky(x\_mid)\*mefunky(x\_lower)) <= 0

x\_upper=x\_mid;

else

x\_lower=x\_mid;

end

x\_mid = (x\_lower\*mefunky(x\_upper) - x\_upper\*mefunky(x\_lower))/(mefunky(x\_upper)- mefunky(x\_lower));

chakarum= chakarum +1;

end

end

%le me giving answer

result = ['The intersection is found to be at, x = ',num2str(x\_mid),...

' & y = ',num2str(funk\_1(x\_mid)),' after, n= ',num2str(chakarum),' iteration(s)'];

disp(result)

***%%%Q.5***

clear variables

close all

clc

mefunky= @(x) tan(x) + tanh(x); % ze function

x\_lower=0;

x\_upper=2\*pi;

x\_mid= (x\_lower + x\_upper)/2;

chakarum=0;

if mefunky(x\_lower)\*mefunky(x\_upper) > 0 %chk if root exists in the interval

error ('Interval Error, The world will end now because of your stupidity!')

else

while abs(mefunky(x\_mid)) > 10^-3 %le me bisecting

if (mefunky(x\_mid)\*mefunky(x\_lower)) <= 0

x\_upper=x\_mid;

else

x\_lower=x\_mid;

end

x\_mid = (x\_lower + x\_upper)/2;

chakarum= chakarum +1;

end

end

%le me giving answer

result = ['The required value is found to be, x = ',num2str(x\_mid];

disp(result)