% Newton

x = 0.05;

x\_old = 100;

x\_true = 0.0623776;

iter = 0;

while abs(x\_old-x) > 10^-3 && x ~= 0

x\_old = x;

x = x - (x^3 - 0.165\*x^2 + 3.993\*10^-4)/(3\*x^2 - 0.33\*x);

iter = iter + 1;

fprintf('Iteration %d: x=%.20f, err=%.20f\n', iter, x, x\_true-x);

pause;

end

xx = -10:0.01:10;

f = xx.^3 - 0.165\*xx.^2 + 3.993\*10^-4;

figure;

plot(f)

grid on

% data fit

x = linspace(0,4\*pi,10);

%x=[1 2 3];

%y=[1 2 3];

y = cos(x);

p = polyfit(x,y,7);

x1 = linspace(0,4\*pi);

%x1=x;

y1 = polyval(p,x1);

figure

plot(x,y,'o')

hold on

plot(x1,y1)

hold off

## Your Assignment

Hand in printouts of both the m-files and the outputs of the two programs. You have 2 weeks

1. Find the roots of the equation

3https://m.njit.edu/Undergraduate/Matlab/M111MATLAB2S08/matlab2_eq2507.png

Use initial guesses of x=1. and x=0.5. What happens if you give an initial guess of x=0? Explain.

2. Find the root of the equation

https://m.njit.edu/Undergraduate/Matlab/M111MATLAB2S08/matlab2_eq4479.png

starting from the initial condition x=0.

How many iterations are required to obtain accuracy of 6 decimal places?

3- Consider the function f(x)=e2x+5x

a-Use the secant algorithm to find a zero of this function.

b. use newton method to find the zero

d. compare results after 50 iterations

e. compare three methods' accuracy be absolute error and relative error.

4- find two different degree polynomial that fit the following data, and plot :

1-

|  |  |
| --- | --- |
| y | x |
| 3 | 1 |
| 7 | 15 |
| -4 | -8 |

2-

|  |  |
| --- | --- |
| e(x)-cos(x) | x |
|  | 1 |
|  | 10 |
|  | -3 |