1 Problems

1. A plot of $\sin(2\pi x)$ from 0 to 1, made with 101 points:

2. A plot of the Julia set, using code directly from website:
3. A plot of the Julia set, using a different complex number for cc:

2 Codes

Code for 1
% Make grid
x = linspace(0,1,101);

% Evaluate function
y = sin(2*pi*x);

%Plot figure
figure
plot(x,y,'r')
xlabel('X')
ylabel('Y')
title('Sin(2\pix)')

Code for 2

%% This code makes a rendering of a Julia set

% number of "pixels" in each direction
N = 1000;

% "window" over which to paint the picture
x = linspace(-2,2,N);
y = linspace(-2,2,N);

fPlot = zeros(N,N); % this will hold the thing to plot
maxIt = 300; % some maximum number of iterations to allow
tol = 100; % stop the iteration at some tolerance
I = sqrt(-1); % a definition if sqrt(-1)

%% Loop over the pixels
for n = 1:N
    for m = 1:N
        z = x(n)+y(m)*I; % starting point
        cc = -.8+.156*I; % constant ... experiment with me

        %% Now do the iteration
        for nit = 1:maxIt
            z = z^2+cc;
            if( abs(z) > tol )
                break
            end
        end
    end
end

fPlot(n,m) = log(nit);
Code for 3

%% This code makes a rendering of a Julia set

% number of "pixels" in each direction
N = 1000;

% "window" over which to paint the picture
x = linspace(-2,2,N);
y = linspace(-2,2,N);

fPlot = zeros(N,N);  % this will hold the thing to plot
maxIt = 300;     % some maximum number of iterations to allow
tol = 100;       % stop the iteration at some tolerance
I = sqrt(-1);   % a definition if sqrt(-1)

%% Loop over the pixels
for n = 1:N
    for m = 1:N
        z = x(n)+y(m)*I;  % starting point
        cc = -.666+.166*I;...-.8+.156*I; % constant ... experiment with me

        %% Now do the iteration
        for nit = 1:maxIt
            z = zˆ2+cc;
            if( abs(z) > tol )
                break
            end
        end

        fPlot(n,m) = log(nit);
    end %% n
end %% m

figure
surf(x,y,fPlot')
colorbar
shading interp
view([0,90]);
title('Julia Set')
surf(x,y,fPlot')
colorbar
shading interp
view([0,90]);
title('Julia set with cc = -.666+.166*I')