**Question 1**

%HW Q1

%TF = Temperature in Fahrenheit

%TC = Temperature in Celcuis

%rho - formula for density

TF = 32:3.6:93.2;

TC = (TF -32) \* (5/9);

rho = 5.5289 \* 10.^(-8) \* TC.^3 - 8.5016 \* 10.^(-6) \*TC.^2 + 6.5622 \* 10.^(5)TC + 0.99987;

plot (TC, rho)

**Question 2**

%Q2

% Range denominations unspecified, so integers used

%x = x values

%y = Maclaurin Series Left Hand Side

%hold on used so both graphs could be plotted

x = 0:(3\*pi/2)

y = 1 - (x.^2)/factorial(2) +(x.^4)/factorial(4) -(x.^6)/factorial(6) +(x.^8)/factorial(8);

**Question 3**

%function to get r and theta values

%r = radius

%theta = angle

% x = x-coordinate

% y = y-coordinate

% use of if and else statements to perform calculations depending on

% quadrant

% theta converted from radians to degrees

function [r, theta] = polar (x,y)

r = sqrt( (x.^2) +(y.^2));

if x < 0

if y > 0

theta = atan(y/x) + pi;

elseif y< 0

theta = atan(y/x) - pi;

else

theta = pi;

end

else

if y > 0

theta = pi/2;

elseif y < 0

theta = -pi/2;

else

theta = 0;

end

end

theta = theta \* 180 / pi;

**Question 4**

%function to get theta, c, cmag and a plot

%function vectorcalcs takes in two vectors a & b

% theta = angle

% c = vector c

% cmag = magnitude of c

% plot3 used to get the 3D plot

function [theta,c,cmag] = vectorcalcs(a,b)

amag = norm(a);

bmag = norm(b);

adotb = dot(a,b);

theta = acos(adotb/amag/bmag) \* 180/pi;

c = cross(a,b);

cmag =norm(c);

x1 = [0 a(1)];

y1 = [0 a(2)];

z1 = [0 a(3)];

x2 = [0 b(1)];

y2 = [0 b(2)];

z2 = [0 b(3)];

x3 = [0 c(1)];

y3 = [0 c(2)];

z3 = [0 c(3)];

x4 = [0 0];

y4 = [0 0];

z4 = [0 0];

plot3(x1,y1,z1,'b--');

hold on;

plot3(x2,y2,z2, 'r--');

hold on;

plot3(x3,y3,z3,'k-');