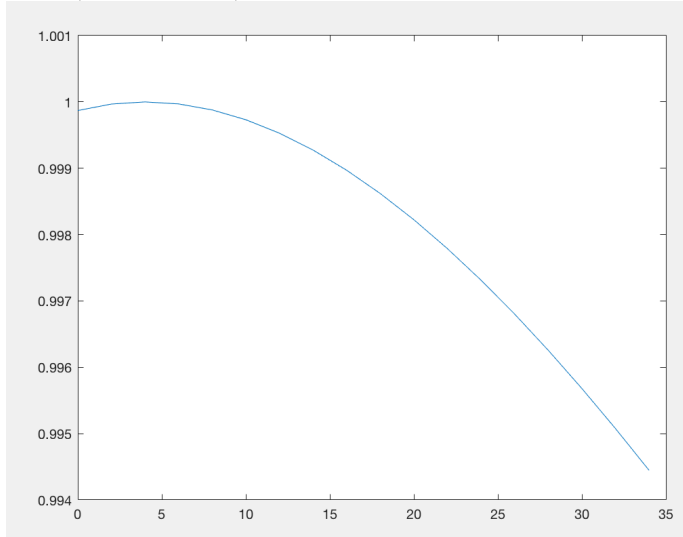


```
% Math 320
% Homework 1
% Sobin Lee
```

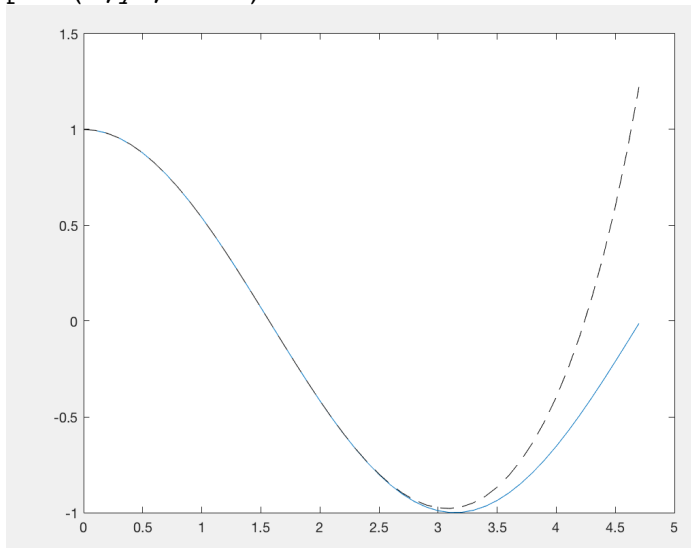
```
%% Question 2.9
```

```
F=32:3.6:93.2; % Temperature in Fahrenheit
C=(5/9)*(F-32); % Temperature in Celcius
density=(5.5289*(10^-8)*C.^3)-(8.5016*(10^-6)*C.^2)+(6.5622*(10^-5)*C)+0.99987; %Density of freshwater function
plot(C,density)
```



```
%% Question 2.15
```

```
x=0:0.1:(3*pi)/2;
y1=cos(x);
y2=1-x.^2/factorial(2)+x.^4/factorial(4)-x.^6/factorial(6)+
x.^8/factorial(8);
plot(x,y1)
hold on
plot(x,y2,'--k')
```



```
%% Question 3.6
```

```
[r,theta]=cartesian_to_polar(x,y)
```

```

function [r,theta]=cartesian_to_polar(x,y)
% This function converts cartesian coordinates to polar coordinates
if x>0
    theta=atan(y/x);
elseif x<0 && y>0
    theta=atan(y/x)+pi;
elseif x<0 && y<0
    theta=atan(y/x)-pi;
elseif x<0 && y==0
    theta=pi;
elseif x==0 && y>0
    theta=pi/2;
elseif x==0 && y<0
    theta=-pi/2;
else
    theta=0;
end
r=(x^2+y^2)^0.5;
theta=theta*180/pi;
end

```

x	y	r	theta
2	0	2	0
2	1	2.2361	26.5651
0	3	3	90
-3	1	3.1623	161.5651
-2	0	2	180
-1	-2	2.2361	-116.5651
0	0	0	0
0	-2	2	-90
2	2	2.8284	45

%% Question 3.20

```

function [th,c,mag]=vector(a,b)
maga=norm(a);
magb=norm(b);
th=acos(dot(a,b)/(maga*magb))*(180/pi);
c=cross(a,b);
mag=norm(c);

```

%Designate values for a and b then run following:

```

[th,c,mag]=vector(a,b)
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)];
plot3(x1,y1,z1,'--',x2,y2,z2,'--',x3,y3,z3)

```

a,b,c,d in order

