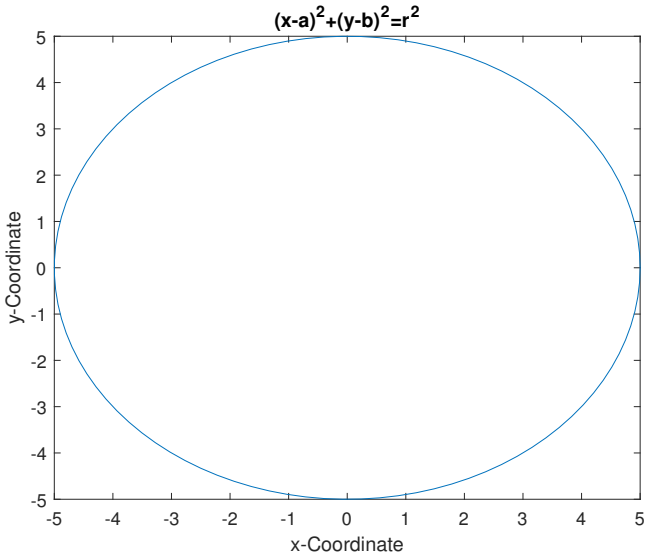
Plotting of Curves and Surfaces (Week 2)

(1) To Plot the Circle

Matlab Code

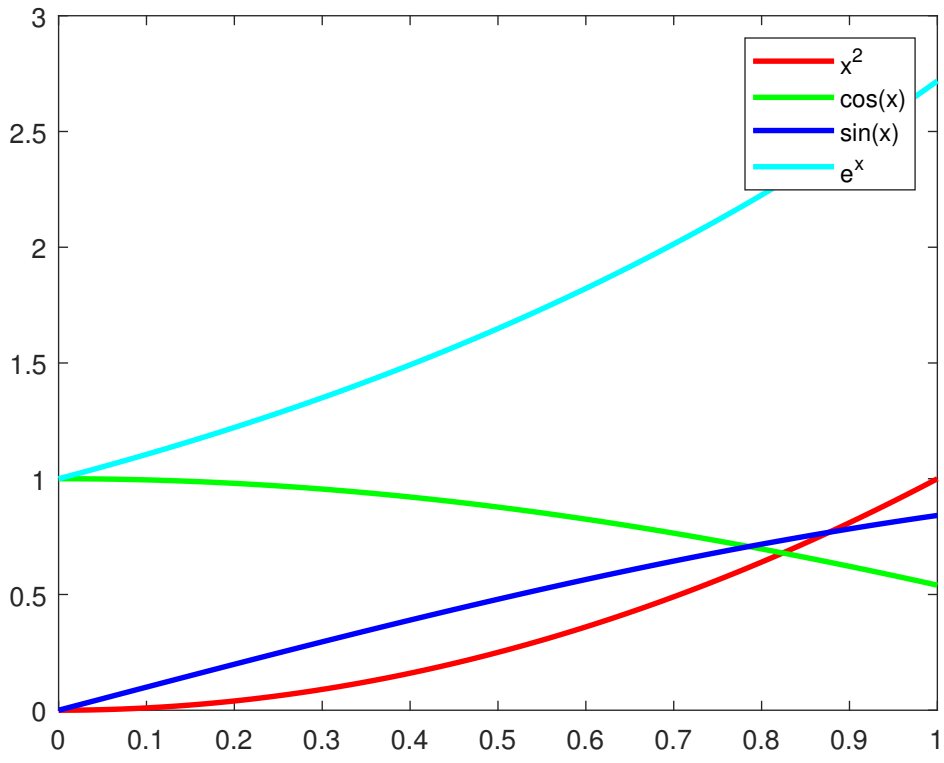
```
clc
clear all
syms r a b
r= input('Enter the radius of the circle')
a= input('Enter the x coordinate of the center')
b= input('Enter the y coordinates of the center')
t = linspace(0, 2*pi, 100);
x = a+r*cos(t);
y = b+r*sin(t);
axis equal
plot(x, y)
xlabel('x-Coordinate')
ylabel('x-Coordinate')
title('(x − a)^2 + (y − b)^2 = r^2')
```

Output



(2) **Multiple plots using Hold on Matlab Code**

```
clc
clear all
x = linspace(0, 1, 100);
plot(x, x.^2,'r', 'LineWidth',2.0)
hold on
plot(x, cos(x), 'g', 'LineWidth',2.0)
hold on
plot(x, sin(x),'b', 'LineWidth',2.0)
hold on
plot(x, exp(x),'c', 'LineWidth',2.0)
legend('x^2', 'cos(x)' , 'sin(x)' , 'e^x')
```



(3) **Multiple plots without command "hold on" Matlab Code**

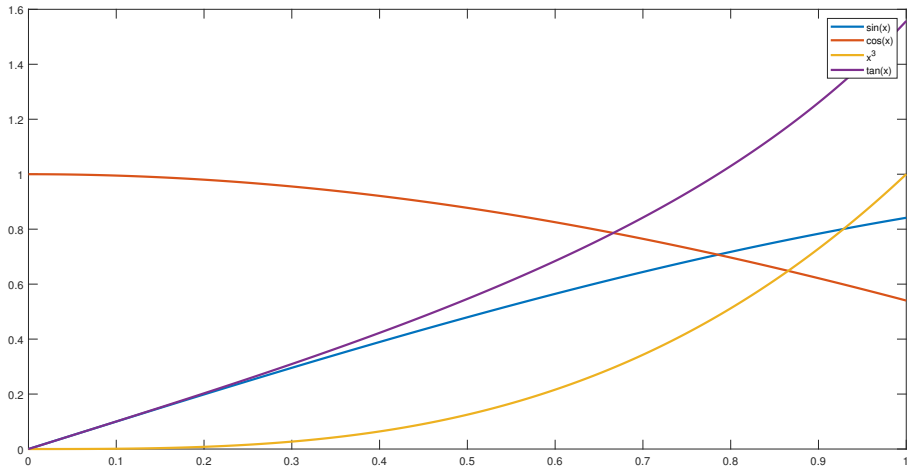
clc

clear all

x = linspace(0, 1, 200);

plot(x, sin(x), x, cos(x), x, $x.^3$, x, tan(x), 'LineWidth',2.0)

legend('sin(x)','cos(x)','x^3','tan(x)') **Output**



(4) **Multiple plots using "subplot "**

Matlab Code

clc

clear all

x=0:0.1:2*pi;

subplot(2,2,1)

plot(x,sin(x));

title('sin(x)') subplot(2,2,2)

plot(x,cos(x),'r-*');

title('cos(x)') subplot(2,2,3)

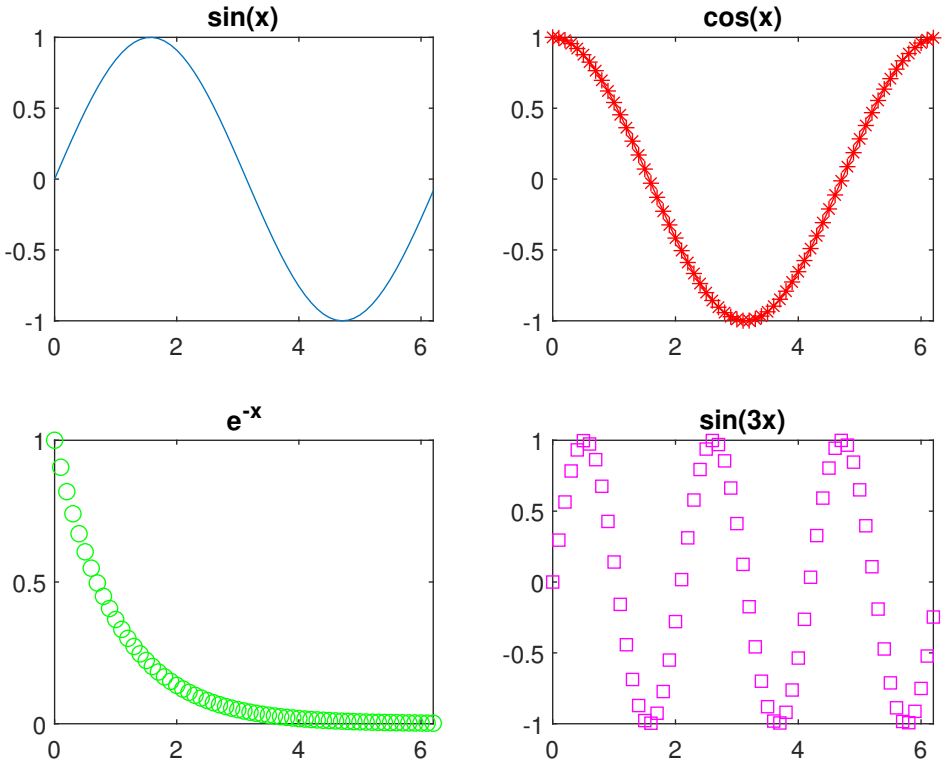
plot(x,$exp(-x)$,'go')

title('e^{-x}') subplot(2,2,4);

plot(x,$sin(3*x)$,'ms')

title('sin(3x)')

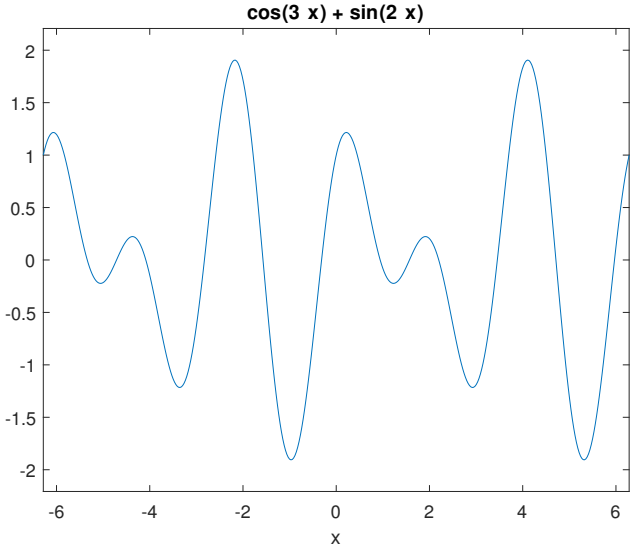
Output

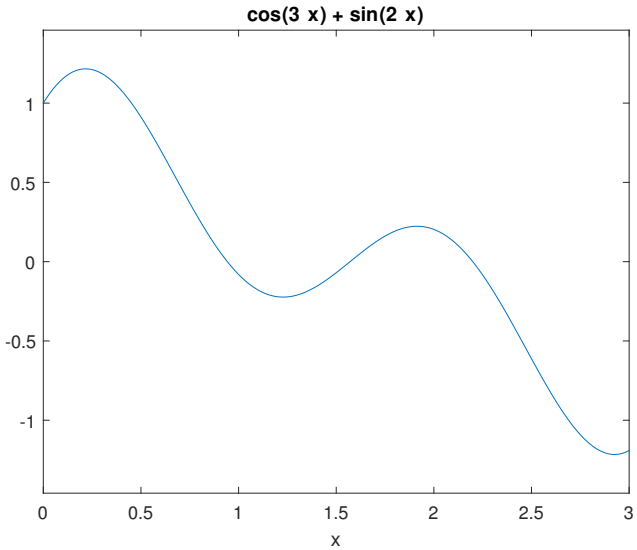


(5) **Graph of the curve using "ezplot "**

Matlab Code

```
clc
clear all
syms x
f=sin(2*x)+cos(3*x)
figure(1)
ezplot(f)
figure(2)
ezplot(f,[0,3])
```



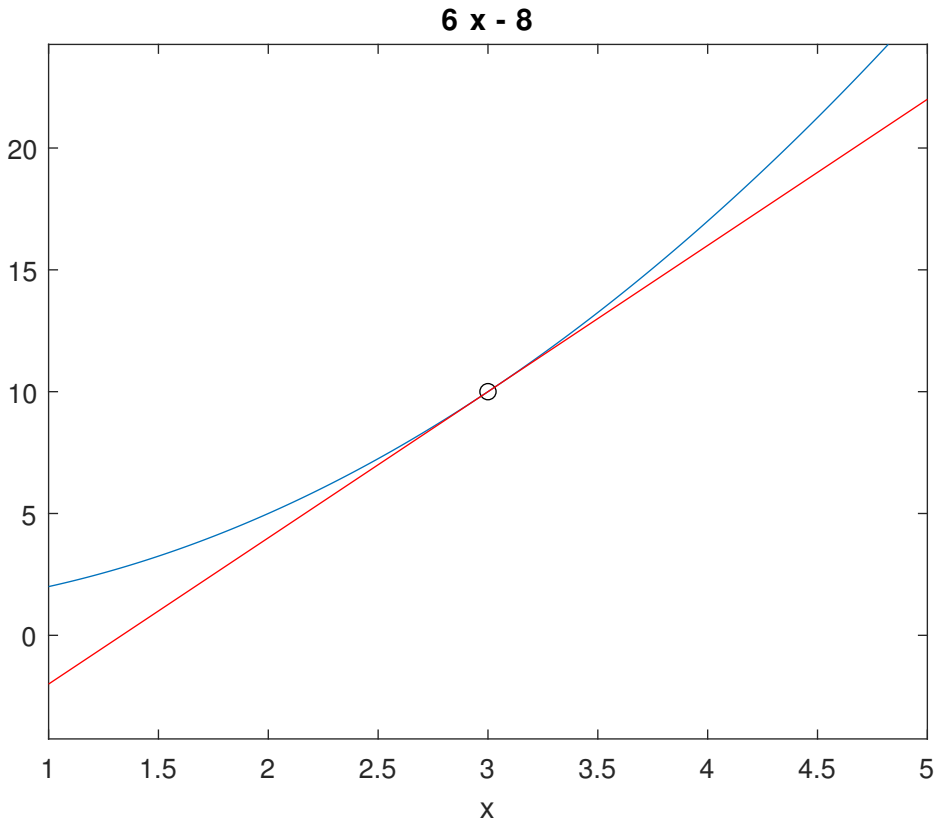


(6) Graph of a curve and its tangent line in the neighbourhood D of a point.

Matlab Code

```
clc
clear all
syms x
y=input('enter the function f in terms of x:')
x1 = input('Enter x value at which tangent : ');
D=[x1-2 x1+2]
ezplot(y,D)
hold on
yd = diff(y,x);
slope = subs(yd,x,x1);
y1 = subs(y,x,x1);
plot(x1,y1,'ko')
Tgtline = slope*(x-x1)+y1
```

Expected Output Based on inputs



Practice Problems

(1) Draw the Ellipse and Hyperbola
(2) Draw any 6 and 8 plots using subplots
(3) Draw multiple graphs using Hold on and Hold off.
(4) Make a list of all the new MATLAB - commands you have learned in this class.