

%Lab 2

%Title: Plotting of curves and computation of differentiation and integration

%Parametric Plot of Circle with
% centre (3,4) and radius 2

theta = linspace(0, 2*pi, 50) % generate points

x = 3 + 2*cos(theta);
y = 4 + 2*sin(theta);

plot(x,y)

xlim([min(x)-0.5, max(x)+0.5])
ylim([min(y)-0.5, max(y)+0.5])

xlabel('x(m)')
ylabel('y(m)')

title('Graph of $(x-3)^2 + (y-4)^2=4$ ')

%Plotting Multiple curve in single window
% window using the command 'hold on'

x = linspace(0, 2*pi, 100)
hold on
plot(x, sin(x), 'red')
plot(x, cos(x), 'green')
plot(x, cos(2*x), 'blue')
legend('sin(x)', 'cos(x)', 'cos(2x)')

or

plot(x,sin(x),'red', x, cos(x), 'green') %without hold on

%Plotting multiple graph in separate window

x = linspace(0, 10, 101);
subplot(2,3,1)
plot(x, sin(x), 'red')
subplot(2,3,2)
plot(x, cos(x), 'blue')
subplot(2,3,4)
plot(x, exp^(-x), 'green')
subplot(2,3,6)
plot(x, sin(3*x), 'black')

**% 5. Plotting multiple curves in a
% single figure window using the command "ezplot"**

```
syms x
f = sin(x);
g = cos(x);
hold on
ez_f = ezplot(f, [-7, 7]); % ezplot(function, 'lower limit and upper limit')
ez_g = ezplot(g, [-7, 7]);
set(ez_f, 'color', 'r')
set(ez_g, 'color', 'b')
legend('sin(x)', 'cos(x)')
```

% Plotting multiple curve in separate figure

```
syms x
f = sin(x)
g = cos(x)
figure(1)
ez_f = ezplot(f, [-7, 7])
set(ez_f, 'color', 'r')
figure(2)
ez_g = ezplot(g, [-7, 7])
set(ez_g, 'color', 'blue')
legend('g(x) = cos(x)')
```

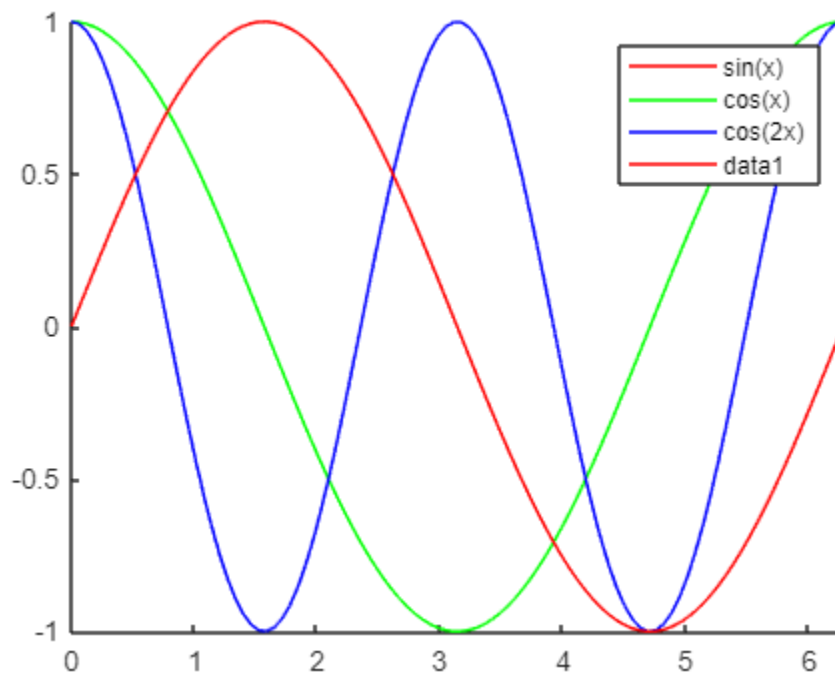
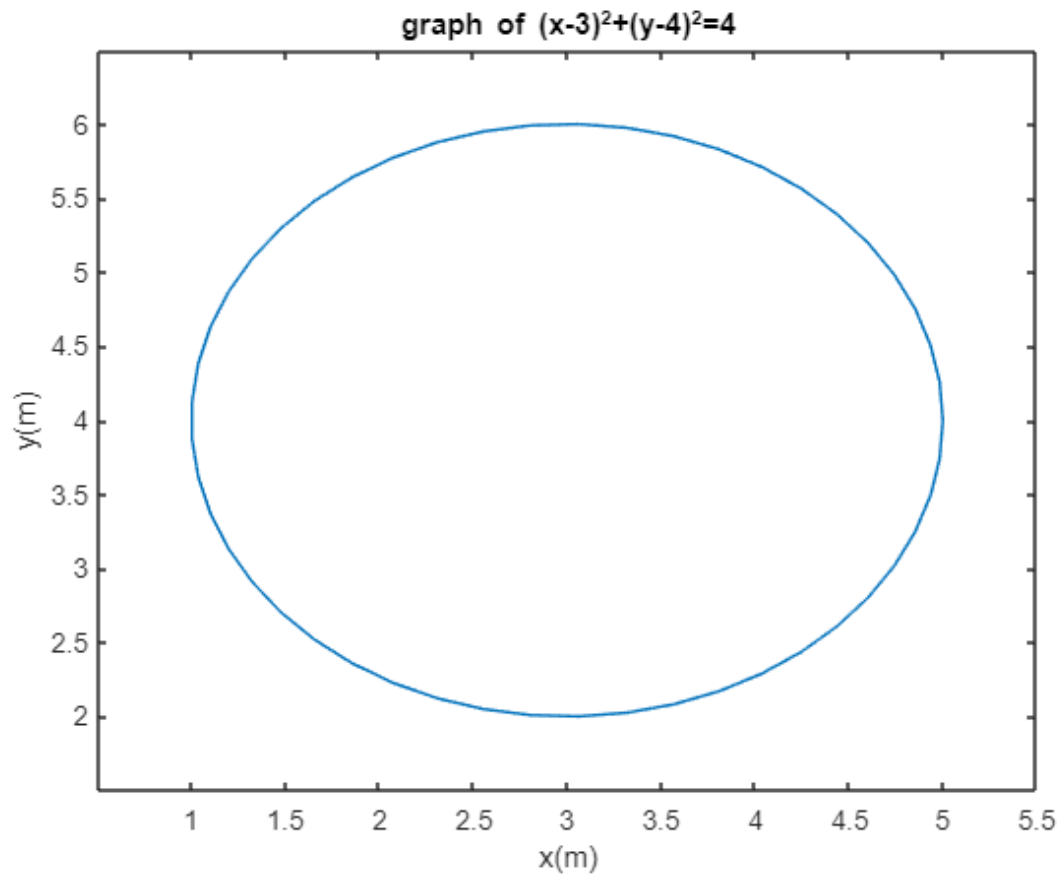
% Compute Differentiation using the command 'diff'

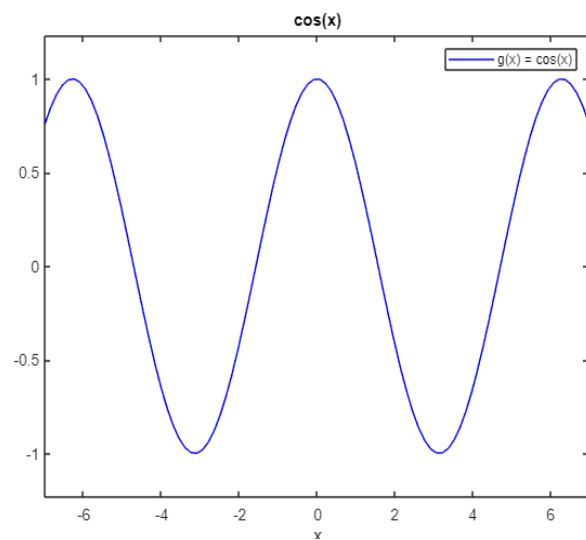
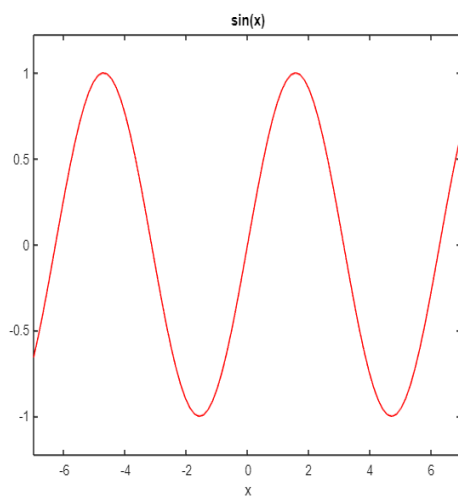
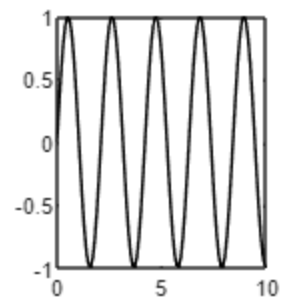
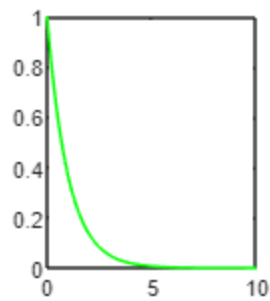
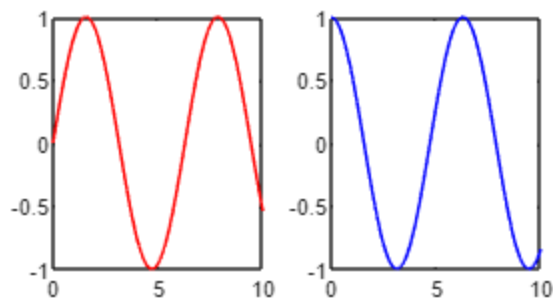
```
syms x y
%f = 2*x^3 - 4*x^2 + sin(x)
f = input('Enter the function f: ')
f_1 = diff(f, x) % w.r.t x
f_2 = diff(f_1, x)
```

% Compute Integration using 'int' command

```
syms x,y
f = 2*x^3 - 4*x^2 + sin(x)
A_f = int(f,x) % w.r.t x
A_f_limit = int(f,x,0,3)
g = x^3 + 5*x*y + y*cos(x)
A_g = int(g,x)
A_g_limit = int(int(g,x,0,3),y,-1,2)
```

Output Window:





```

A_f =
x^4/2 - (4*x^3)/3 - cos(x)
A_f_limit =
11/2 - cos(3)
A_g =
(5*x^2*y)/2 + y*sin(x) + x^4/4
A_g_limit =
(3*sin(3))/2 + 189/2

```