MATLAB ASSIGNMENT -2

BY:

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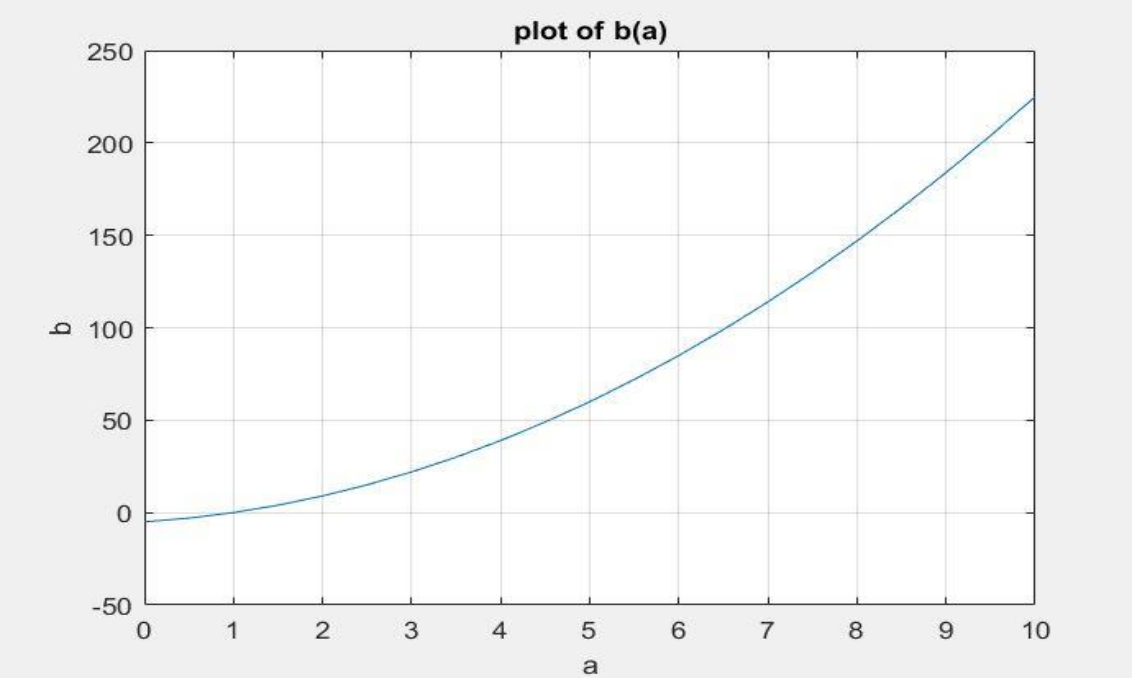
Q1) **Draw a curve for the following linear equation. b = 2a^2 + 3a -5. Count value should be 0.5.**

Code:

```
a=[0:0.5:10];
b=2.*a.^2+3.*a-5;
plot(a,b);
title('plot of b(a)')
xlabel('a')
ylabel('b')
grid on
```

graph:

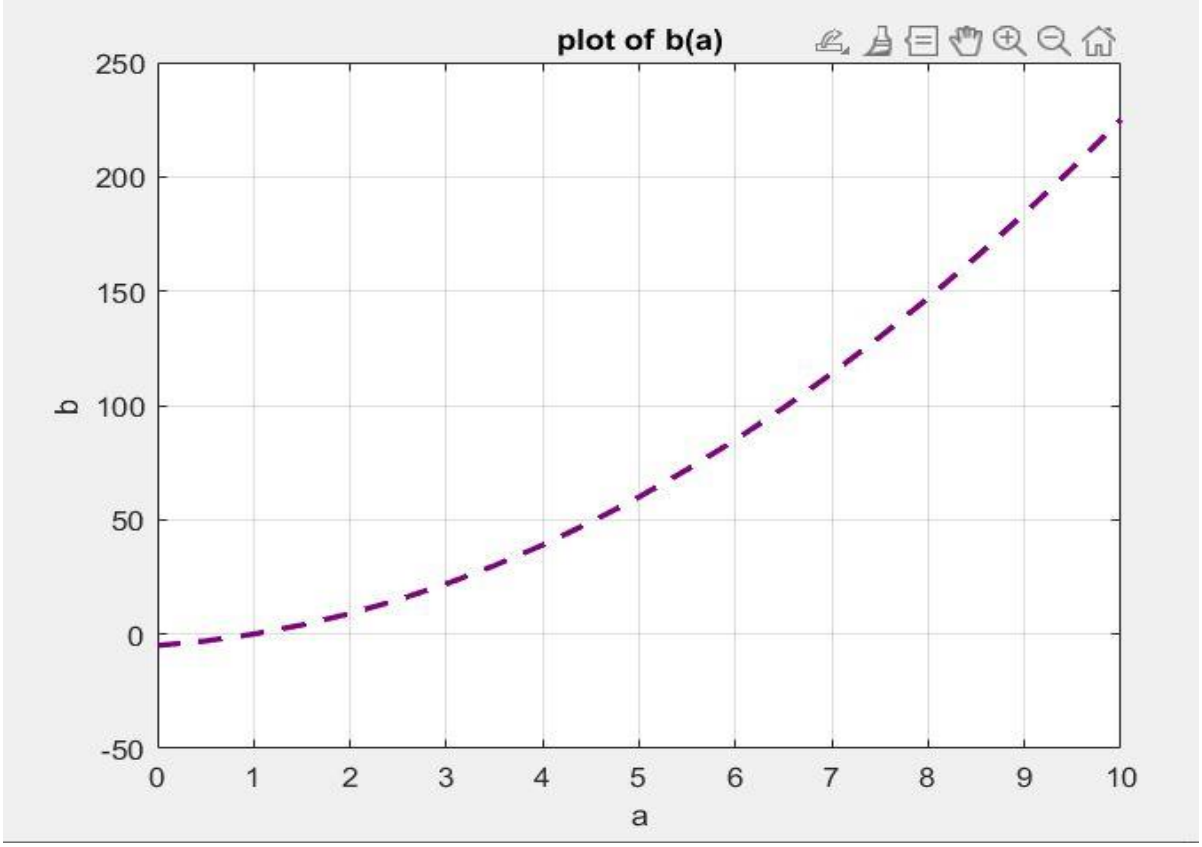


Q2) Refine the plot given in question1 with Line pattern, color, and thickness.

Code:

```
a=[0:0.5:10];
b=2.*a.^2+3.*a-5;
plot(a,b,'LineWidth',2,LineStyle='--',Color='#800080');
title('plot of b(a)')
xlabel('a')
ylabel('b')
grid on
```

graph:



Q3) 3. Draw multiple curves

a = step count should be 0.5.

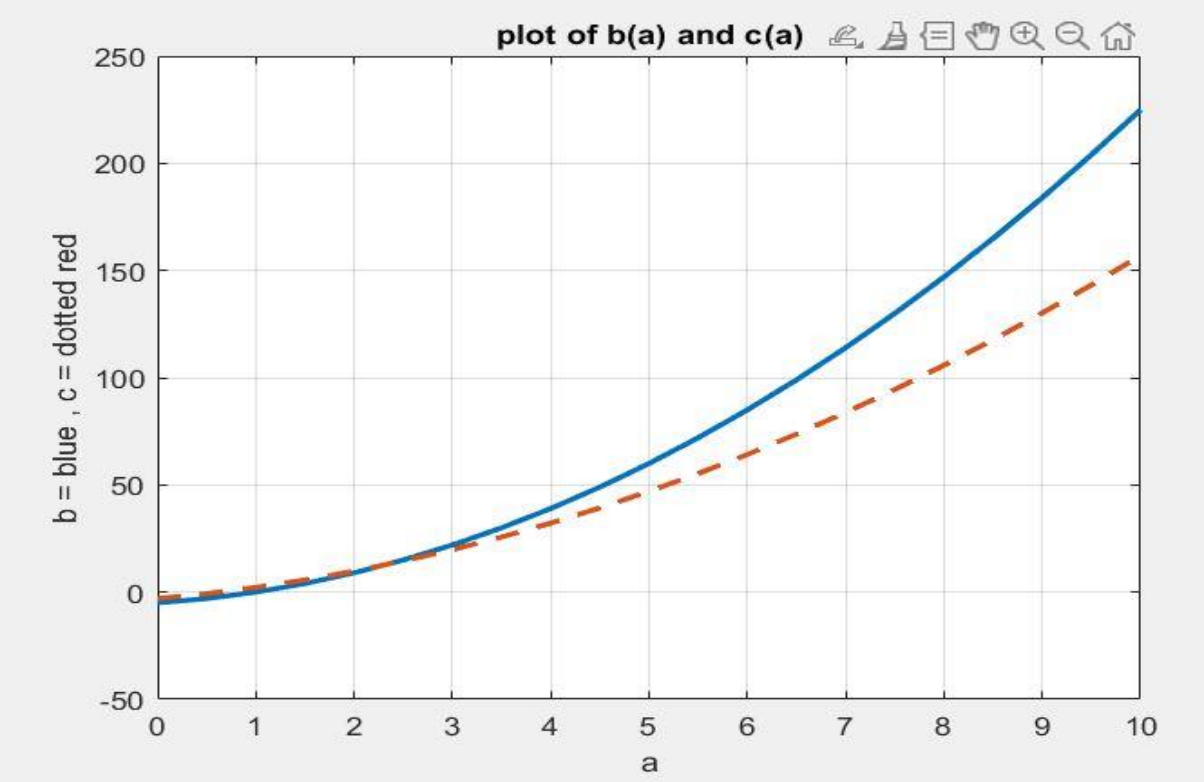
b = 2a^2 + 3a -5;

c = 1.2a^2 +4a-3;

code:

```
a=[0:0.5:10];
b = 2.*a.^2 + 3.*a -5;
c = 1.2.*a.^2 +4.*a-3;
plot(a,b,LineWidth=2)
hold on
plot(a,c,"LineStyle","--",LineWidth=2)
title('plot of b(a) and c(a)')
xlabel('a')
ylabel('b = blue , c = dotted red')
grid on
```

graph:



Q4) Draw symbols

a = step count should be 0.5.

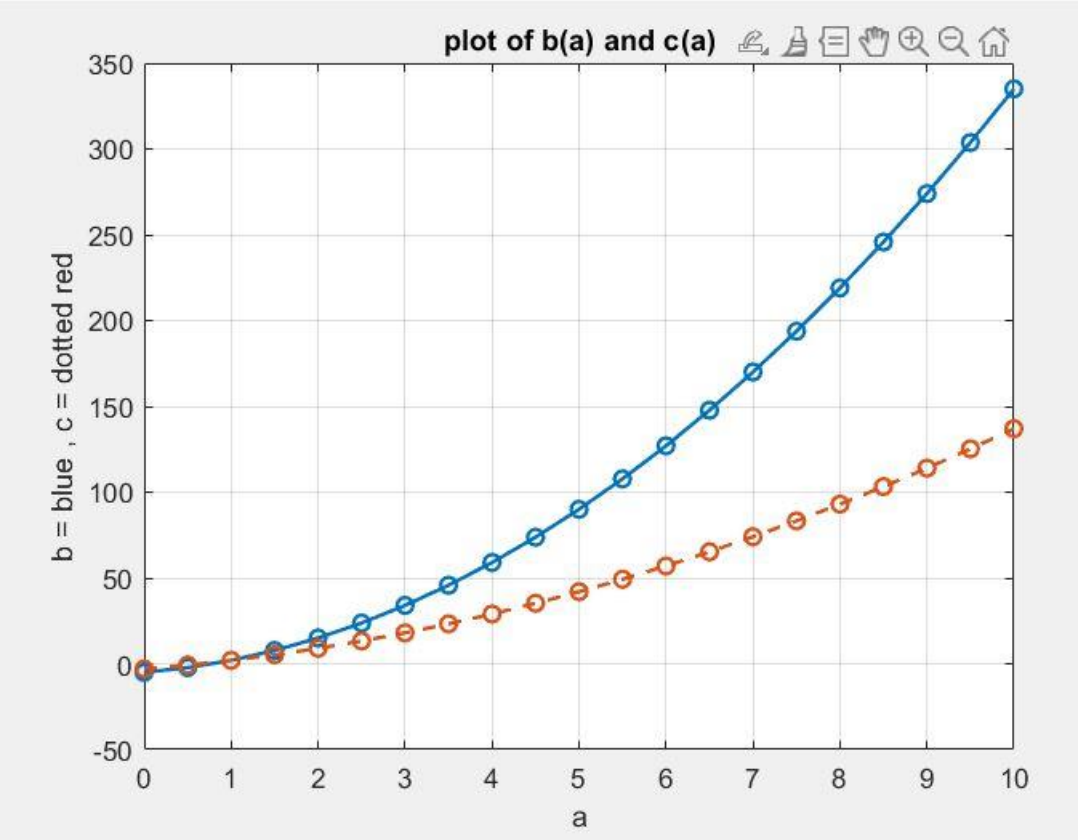
b = 3a 2 + 4a -5;

c = a 2 +4a-3;

code:

```
a= [0:0.5:10];
b = 3.*a.^2 + 4.*a -5;
c = 1.*a.^2 + 4.*a-3;
plot(a,b,'-o',LineWidth=1.4)
hold on
plot(a,c,'-o',"LineStyle","--",LineWidth=1.4)
title('plot of b(a) and c(a)')
xlabel('a')
ylabel('b = blue , c = dotted red')
grid on
```

graph:



Q5) **3v -3w +6x -2y+z = 14**

3v -6w +x -y +z = 25

2v -4w +4x -4y+3z = 5

3v -6w +5x -y +2z = 30

2v -4w +9x +y +z = 30

Construct a matrix for the above equations and find out

1. Inverse of the matrix.

2. Transposition.

Code:

```
syms v w x y z
eq1 = 3*v -3*w +6*x -2*y +1*z == 14;
eq2 = 3*v -6*w +1*x -1*y +1*z == 25;
eq3 = 2*v -4*w +4*x -4*y +3*z == 5;
eq4 = 3*v -6*w +5*x -1*y +2*z == 30;
eq5 = 2*v -4*w +9*x +1*y +1*z == 30;
[A,B] = equationsToMatrix([eq1, eq2, eq3, eq4, eq5], [v,
w, x, y, z])
A_inverse=inv(A)
A_transpose=A.'
```

output:

```
A =

[3, -3, 6, -2, 1]
[3, -6, 1, -1, 1]
[2, -4, 4, -4, 3]
[3, -6, 5, -1, 2]
[2, -4, 9, 1, 1]
```

```
B =

14
25
 5
30
30


A_inverse =

[2/3, -61/60, -49/60, 23/12, -31/30]
[1/3, -47/60, -23/60, 13/12, -17/30]
[  0,    1/8,    1/8,  -3/8,    1/4]
[  0, -29/40, -21/40,  11/8,  -9/20]
[  0,   -3/2,   -1/2,   5/2,     -1]


A transpose =

[ 3, 3, 2,  3,  2]
[-3, -6, -4, -6, -4]
[ 6, 1, 4,  5,  9]
[-2, -1, -4, -1, 1]
[ 1, 1,  3,  2,  1]
```

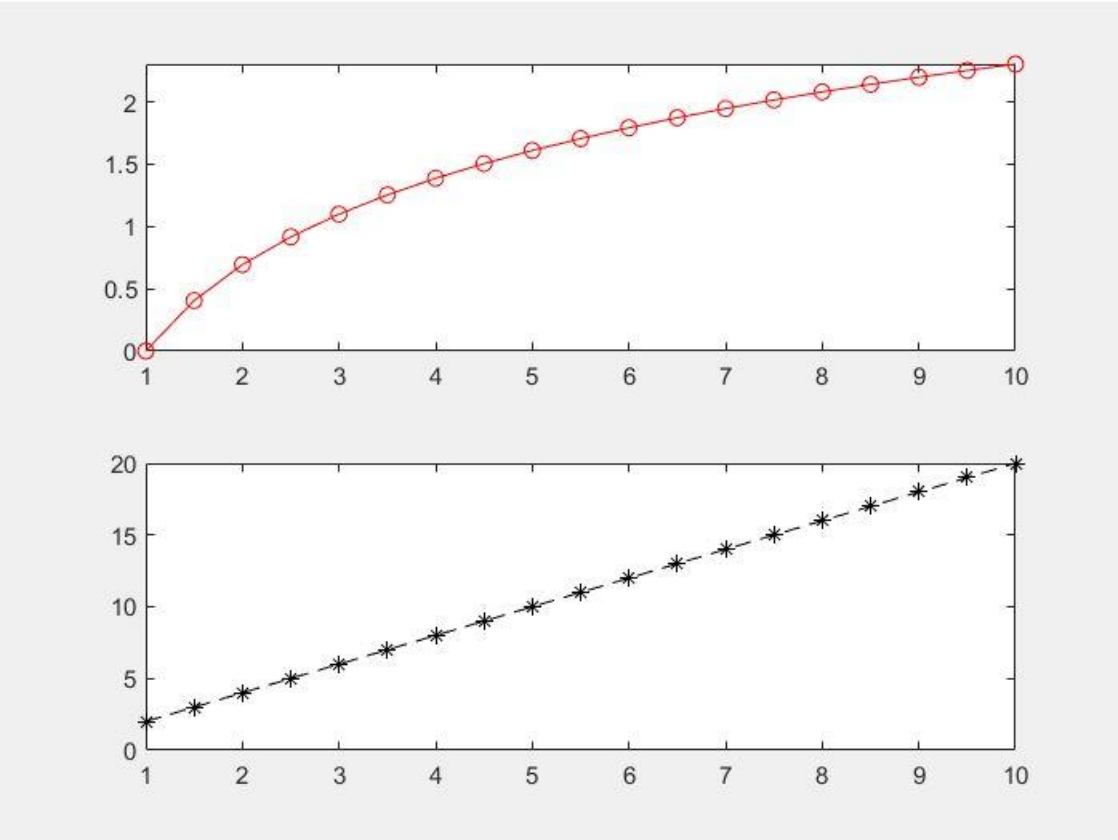
Q6) Plot sub graphs:
Y=log(x)
Z=2x

Code:

```
x=1:0.5:10;
a = log(x);
b =2.*x;
subplot(2,1,1);
plot(x,a,'r-o');
subplot(2,1,2);
```

```
plot(x,b,'k--*');
```

graph:



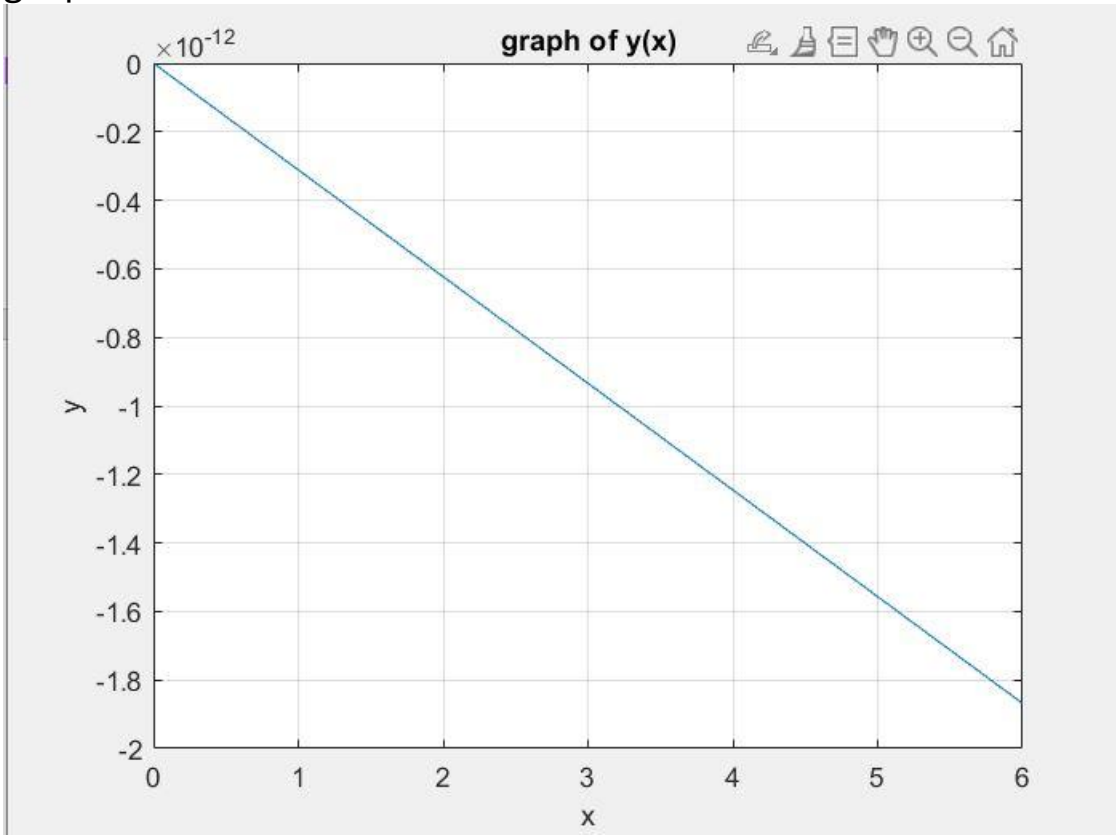
Q7) Plots a sine wave based on the provided amplitude and frequency using the equation y = amplitude*sin (2pi*frequency*x) on the interval defined by [0;2*pi].

Code:

```
prompt = 'enter frequency:';
prompt1='enter amplitude';
f=input(prompt,'s')
x=(0:2*pi);
a=input(prompt1,'s')
y=a.*sin(2*pi*f*x);
plot(x,y)
xlabel('x')
ylabel('y')
title('graph of y(x)')
```

```
grid on
```

graph:



Q8) Create an anonymous function f which accepts a (possibly vector valued) numeric input and returns a (possibly vector valued) numeric output according to the mathematical formula f(x) = x^2 - sin(x). Use this function along with the fminsearch function to find the local minimum value near the initial value near x0 = 0.5. Store the local minimizing value and the corresponding function value in the variables xmin and ymin respectively.

Code:

```
f=@(x)(x.^2-sin(x));
x0=[0.5];
t=0.5:0.1:2*pi;
xmin=fminsearch(f,x0)
```

```
ymin=f(xmin)
plot(t,f(t))
```

output:

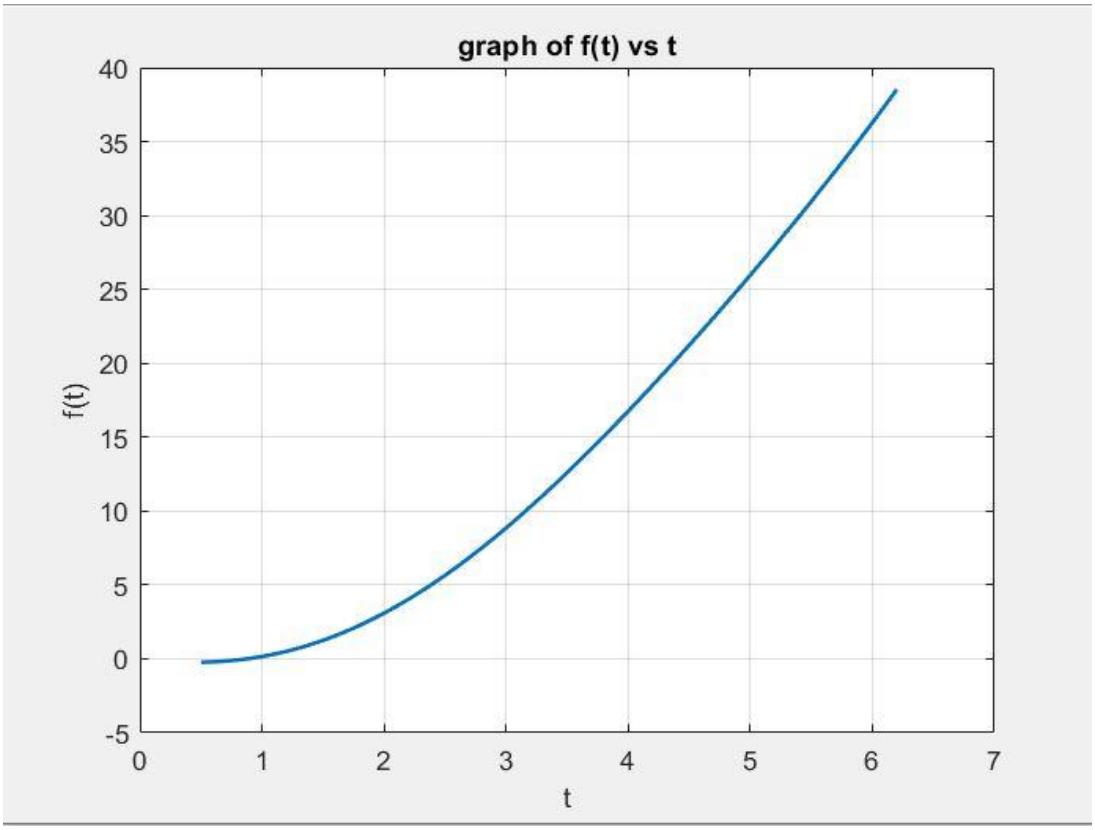
```
xmin =

    0.4502


ymin =

   -0.2325
```

Graph:



Q9) Draw a pie chart for the given data.

18 4 6 12 9

Code:

```
x= [18 4 6 12 9];
pie(x)
```

graph: