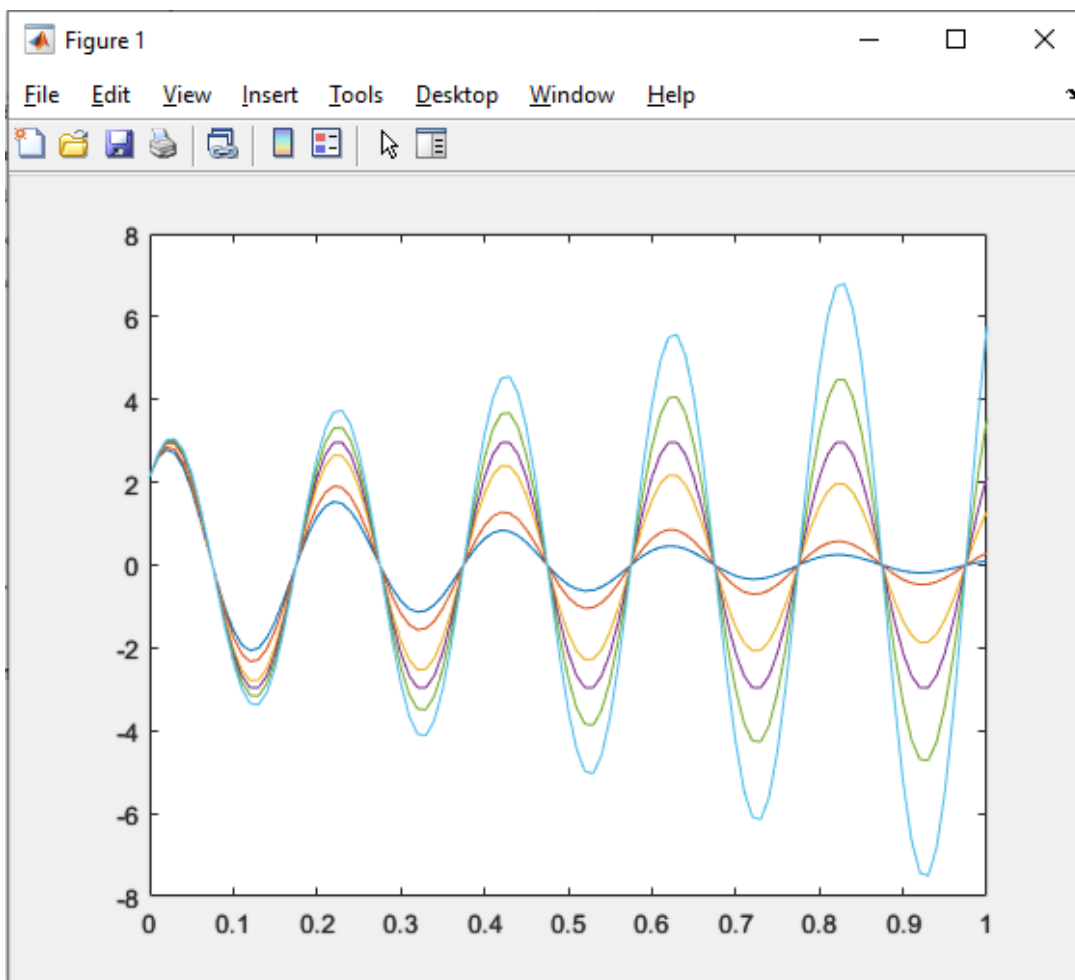


### Task A

```
A = 3;  
phi = -1/4*pi;  
w=2*pi*5;  
f=5;  
lam = [-3 -2 -0.5 0 0.5 1];  
t=(0:0.01:1)';  
for ii= 1:length(lam)  
    y(:,ii)=A.*exp(lam(ii).*t).*cos(w.*t+phi)  
end  
  
plot(t,y)
```



Task B

$$\Lambda = -0,5$$

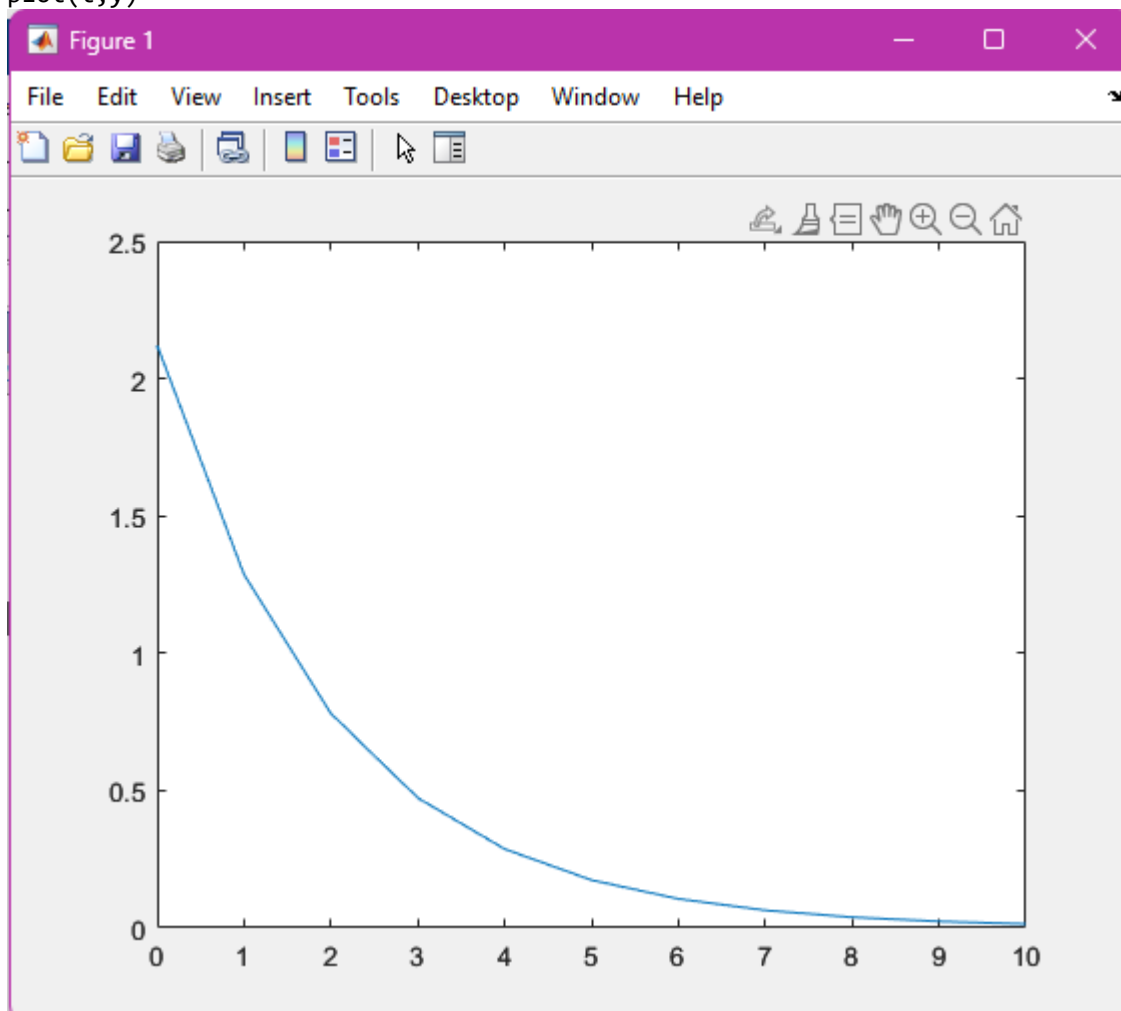
$$\Lambda = 1/RC \Rightarrow -0,5 = 1/T \Rightarrow T = 2 \text{ (time constant)}$$

RC=time constant

$$Y(t) = A \cdot e^{\Lambda t}$$

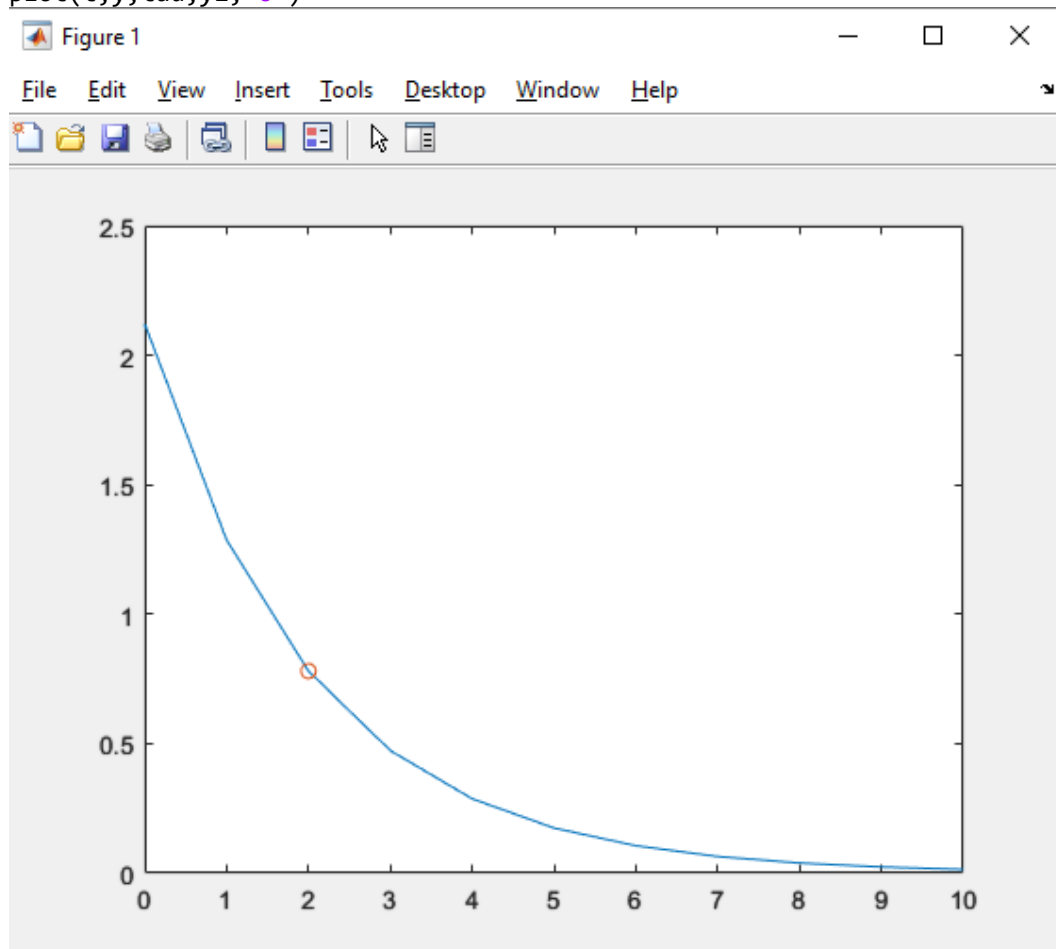
Task C

```
A = 3;  
phi = -1/4*pi;  
w=0;  
f=5;  
lam = -0.5;  
t= (0:10);  
y= A.*exp(lam.*t).*cos(w.*t+phi);  
plot(t,y)
```



#### Task D

```
A = 3;  
phi = -1/4*pi;  
w=2*pi*5;  
f=5;  
lam = -0.5  
tau = 2  
t= (0:10)  
y= A.*exp(lam.*t).*cos(w.*t+phi)  
  
y2= A.*exp(lam.*tau).*cos(w.*tau+phi)  
plot(t,y,tau,y2,'o')
```



Task E

$$0.78/2.12 = 0.37$$

$$1-0.37 = 0.63 \rightarrow \text{to get \%} \rightarrow 0.63*100 = 63\%$$

Y1 coordinate = 2.12

Y2 Coordinate = 0.78

X 0	X 2
Y 2.12132	Y 0.78039

Tasks F,G,H,I

A=3;

phi=0;

n=0:10;

subplot(2,2,1);%f

OMEGA=pi;

a=2/3;

y=A\*a.^n.\*cos(OMEGA\*n+phi);

stem(n,y)

subplot(2,2,2);%g

OMEGA=0;

a=3/2;

y=A\*a.^n.\*cos(OMEGA\*n+phi);

stem(n,y)

subplot(2,2,3);%h

OMEGA=pi;

y=A\*a.^n.\*cos(OMEGA\*n+phi);

stem(n,y)

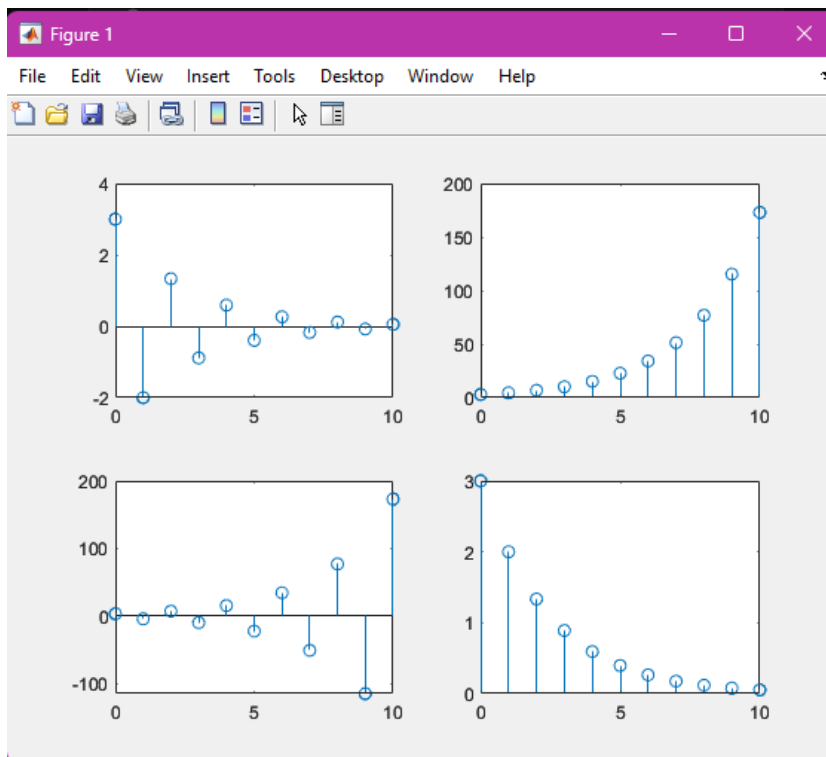
subplot(2,2,4);%i

a=2/3;

OMEGA=0;

y=A\*a.^n.\*cos(OMEGA\*n+phi);

stem(n,y)



Task J

$$A = 3$$

$$\varphi = -\frac{1}{2}\pi = -0,5\pi$$

$$\omega = 40\pi$$

$$\gamma = 20 \text{ Hz}$$

$$\sigma = -5$$

$$y(t) = 3 \cdot e^{-5t} \cdot \cos(40\pi t - 0,5\pi)$$

$$X = A \cdot e^{j\varphi} = 3 \cdot e^{-j0,5\pi}$$

$$s = -5 + 40\pi j$$

$$y(t) = \Re \{ 3 \cdot e^{j-0,5\pi} \cdot e^{-5+40\pi j \cdot t} \}$$

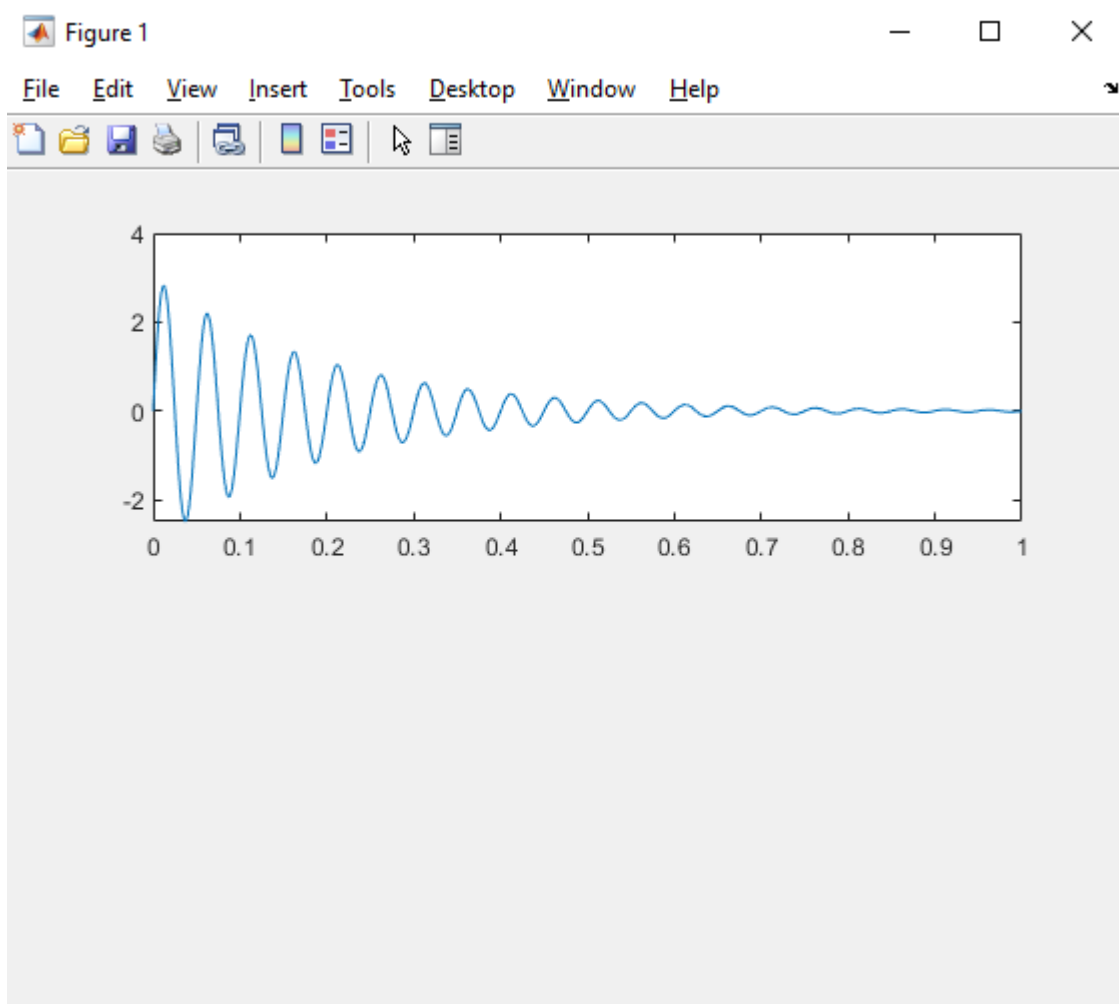
## Task K

```
A = 3;  
phi = -0.5*pi;  
w=2*pi*f;  
f=20;  
lam = -5;  
t=0:0.001:1;
```

```
Y=3.*exp(-1j*0.5*pi);
```

```
s= -5+40*pi*1j;
```

```
subplot(2,1,1)  
plot(t,real(Y.*exp(s.*t)))
```



## Task L

```
A = 3;  
phi = -0.5*pi;  
w=2*pi*f;  
f=20;  
lam = -5;  
t=0:0.001:1;
```

```
Y=3.*exp(-1j*0.5*pi);
```

```
s= -5+40*pi*1j;
```

```
y=A.*exp(lam.*t).*cos(w.*t+phi);
```

```
subplot(2,1,1)  
plot(t,real(Y.*exp(s.*t)))
```

```
subplot(2,1,2)  
plot(t,y)
```

