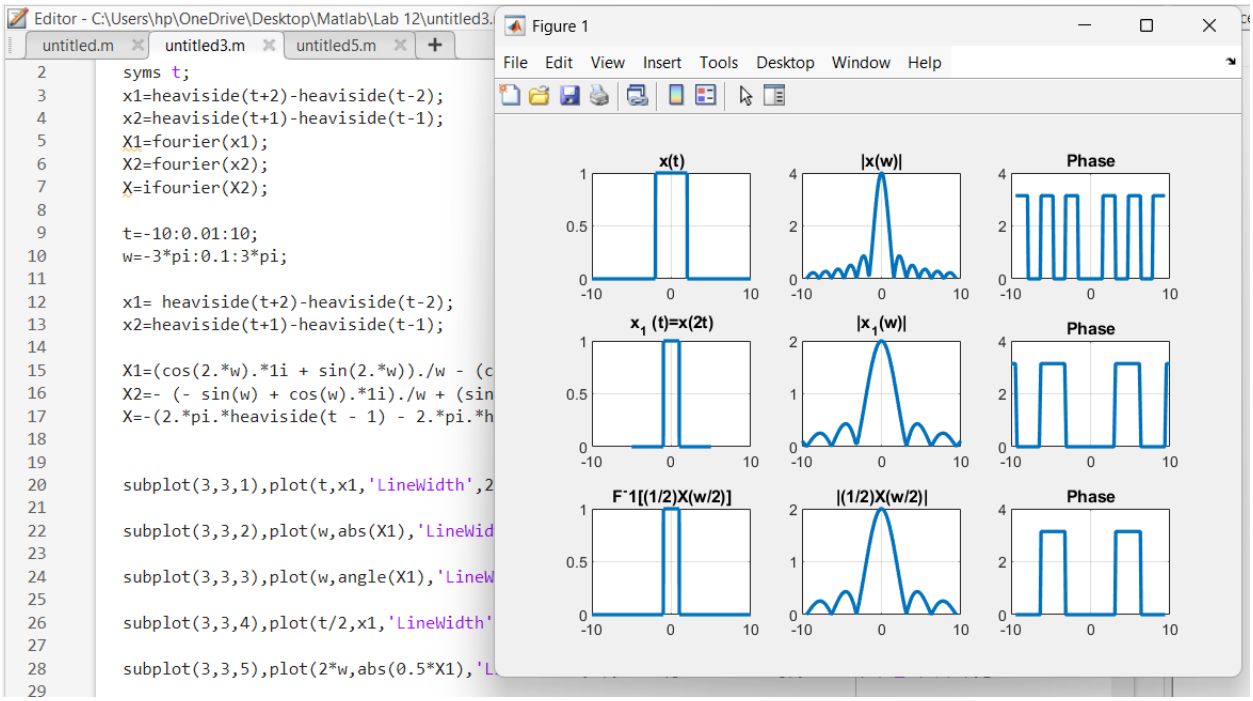
Lab 12

Task 2

Editor - C:\Users\hp\OneDrive\Desktop\Matlab\Lab 12\untitled3.m

untitled.m | untitled3.m | untitled5.m

```
syms t;
x1=heaviside(t+2)-heaviside(t-2);
x2=heaviside(t+1)-heaviside(t-1);
X1=fourier(x1);
X2=fourier(x2);
X=ifourier(X2);

t=-10:0.01:10;
w=-3*pi:0.1:3*pi;

x1= heaviside(t+2)-heaviside(t-2);
x2=heaviside(t+1)-heaviside(t-1);

X1=(cos(2.*w).*1i + sin(2.*w))./w - (cos(2.*w).*1i - sin(2.*w))./w;
X2=- (- sin(w) + cos(w).*1i)./w + (sin(w) + cos(w).*1i)./w;
X=-(2.*pi.*heaviside(t - 1) - 2.*pi.*heaviside(t + 1))./(2.*pi);


subplot(3,3,1),plot(t,x1,'LineWidth',2),axis([-10 10 0 1]),title('x(t)'),grid

subplot(3,3,2),plot(w,abs(X1),'LineWidth',2),axis([-10 10 0 4]),title('|x(w)|'),grid

subplot(3,3,3),plot(w,angle(X1),'LineWidth',2),axis([-10 10 0 4]),title('Phase'),grid

subplot(3,3,4),plot(t/2,x1,'LineWidth',2),axis([-10 10 0 1]),title('x_1 (t)=x(2t)'),grid

subplot(3,3,5),plot(2*w,abs(0.5*X1),'LineWidth',2),axis([-10 10 0 2]),title('|x_1(w)|'),grid

subplot(3,3,6),plot(2*w,angle(0.5*X1),'LineWidth',2),axis([-10 10 0 4]),title('Phase'),grid

subplot(3,3,7),plot(t,x2,'LineWidth',2),axis([-10 10 0 1]),title('F^-1[(1/2)X(w/2)]'),grid

subplot(3,3,8),plot(w,abs(X2),'LineWidth',2),axis([-10 10 0 2]),title('|(1/2)X(w/2)|'),grid

subplot(3,3,9),plot(w,angle(X2),'LineWidth',2),axis([-10 10 0 4]),title('Phase'),grid
```


Editor - C:\Users\hp\OneDrive\Desktop\Matlab\Lab 12\untitled3.
untitled.m
untitled3.m
untitled5.m
2 syms t;
3 x1=heaviside(t+2)-heaviside(t-2);
4 x2=heaviside(t+1)-heaviside(t-1);
5 X1=fourier(x1);
6 X2=fourier(x2);
7 X=ifourier(X2);
8
9 t=-10:0.01:10;
10 w=-3*pi:0.1:3*pi;
11
12 x1= heaviside(t+2)-heaviside(t-2);
13 x2=heaviside(t+1)-heaviside(t-1);
14
15 X1=(cos(2.*w).*1i + sin(2.*w))./w - (c
16 X2=- (- sin(w) + cos(w).*1i)./w + (sin
17 X=-(2.*pi.*heaviside(t - 1) - 2.*pi.*h
18
19
20 subplot(3,3,1),plot(t,x1,'LineWidth',2
21
22 subplot(3,3,2),plot(w,abs(X1),'LineWid
23
24 subplot(3,3,3),plot(w,angle(X1),'LineW
25
26 subplot(3,3,4),plot(t/2,x1,'LineWidth'
27
28 subplot(3,3,5),plot(2*w,abs(0.5*X1),'L
29
Figure 1
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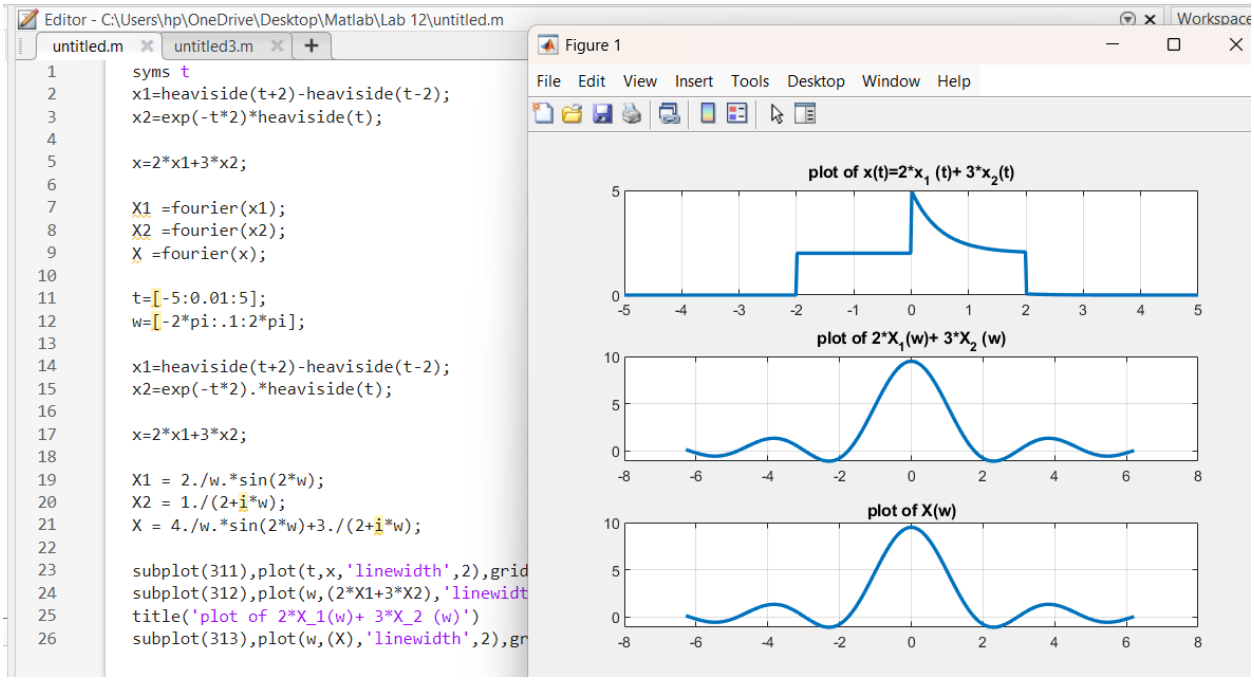
x(t)
|x(w)|
Phase
x1 (t)=x(2t)
|x1(w)|
Phase
F-1[(1/2)X(w/2)]
|(1/2)X(w/2)|
Phase

Task 1

Editor - C:\Users\hp\OneDrive\Desktop\Matlab\Lab 12\untitled.m

untitled.m | untitled3.m

```
syms t
x1=heaviside(t+2)-heaviside(t-2);
x2=exp(-t*2)*heaviside(t);

x=2*x1+3*x2;

X1 =fourier(x1);
X2 =fourier(x2);
X =fourier(x);

t=[-5:0.01:5];
w=[-2*pi:.1:2*pi];

x1=heaviside(t+2)-heaviside(t-2);
x2=exp(-t*2).*heaviside(t);

x=2*x1+3*x2;

X1 = 2./w.*sin(2*w);
X2 = 1./(2+i*w);
X = 4./w.*sin(2*w)+3./(2+i*w);

subplot(311),plot(t,x,'linewidth',2),grid,title('plot of x(t)=2*x_1 (t)+ 3*x_2(t)')
subplot(312),plot(w,(2*X1+3*X2),'linewidth',2),grid,
title('plot of 2*X_1(w)+ 3*X_2 (w)')
subplot(313),plot(w,(X),'linewidth',2),grid,title('plot of X(w)')
```



The code for figure 12.2 graph:

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untitled5.m

```
syms t;

x1=heaviside(t+2)-heaviside(t-2);
X1=fourier(x1);
x2=exp(-2*t)*heaviside(t);
X2=fourier(x2);
x_def=2*x1+3*x2;

X_DEF=fourier(x_def);

t=[-5:0.01:5];
w=[-2*pi:0.01:2*pi];

X1=(cos(2*w)*1i+sin(2*w))./w-(cos(2*w)*1i-sin(2*w))./w;
X2=1./(2 + w*1i);
x=2*X1+3*X2;
X_DEF=3./(2+w*1i)-2*exp(-w*2i).*(pi*dirac(w)-1i./w)+2*exp(w*2i).*(pi*dirac(w)-1i./w);

subplot(2,2,1)
plot(w,abs(x),'LineWidth',2)
xlabel('w-->')
title('magnitude plot of 2*X_1 (w)+ 3*X_2 (w)'),grid, axis([-10 10 0 10])

subplot(2,2,2)
plot(w,angle(x),'LineWidth',2)
xlabel('w-->')
title('phase plot of 2*X_1 (w)+ 3*X_2 (w)'),grid, axis([-10 10 -4 4])

subplot(2,2,3)
plot(w,abs(X_DEF),'LineWidth',2)
xlabel('w-->')
title('magnitude plot of F(2*x_1 (w)+ 3*x_2 (w))'),grid,axis([-10 10 0 10])

subplot(2,2,4)
plot(w,angle(X_DEF),'LineWidth',2)
xlabel('w-->')
title('phase plot of F(2*x_1 (w)+ 3*x_2 (w))'),grid,axis([-10 10 -4 4])
```

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```
14
15      X1=(cos(2*w)*1i+sin(2*w))./w-(co
16      X2=1./(2 + w*1i);
17      x=2*X1+3*X2;
18      X_DEF=3./(2+w*1i)-2*exp(-w*2i).*
19
20      subplot(2,2,1)
21      plot(w,abs(x),'LineWidth',2)
22      xlabel('w-->')
23      title('magnitude plot of 2*X_1 (
24
25      subplot(2,2,2)
26      plot(w,angle(x),'LineWidth',2)
27      xlabel('w-->')
28      title('phase plot of 2*X_1 (w)+
29
30      subplot(2,2,3)
31      plot(w,abs(X_DEF),'LineWidth',2)
32      xlabel('w-->')
33      title('magnitude plot of F(2*x_1
34
35      subplot(2,2,4)
36      plot(w,angle(X_DEF),'LineWidth',
37      xlabel('w-->')
38      title('phase plot of F(2*x_1 (w)-
39
40
```

Figure 1

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