

Σήματα και Συστήματα 2019 – Εργαστήριο
Εφαρμογή 5
Λάμπρος Γραμματικόπουλος , ΑΜ: 2022201800038

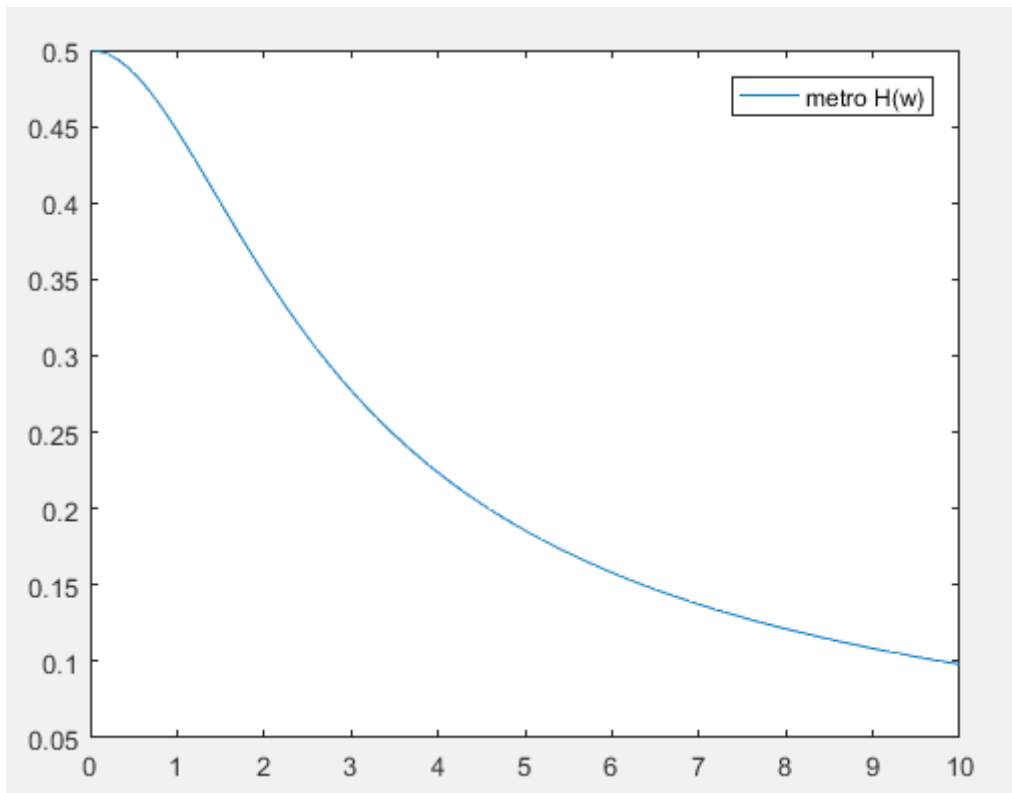
Ερώτημα 1ο

```
%1  
syms t w;  
h=exp(-2*t)*heaviside(t);  
H=fourier(h,w)  
w1=0:0.1:10;  
HH=subs(H,w,w1);
```

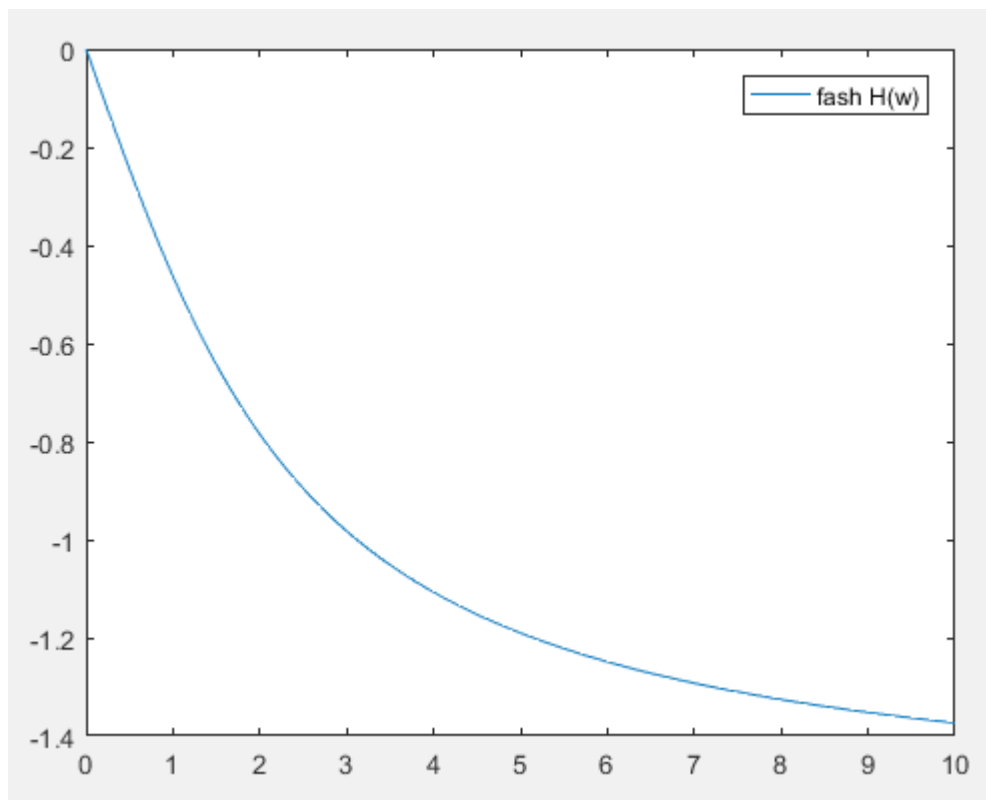
H =

$1/(2 + w \cdot 1i)$

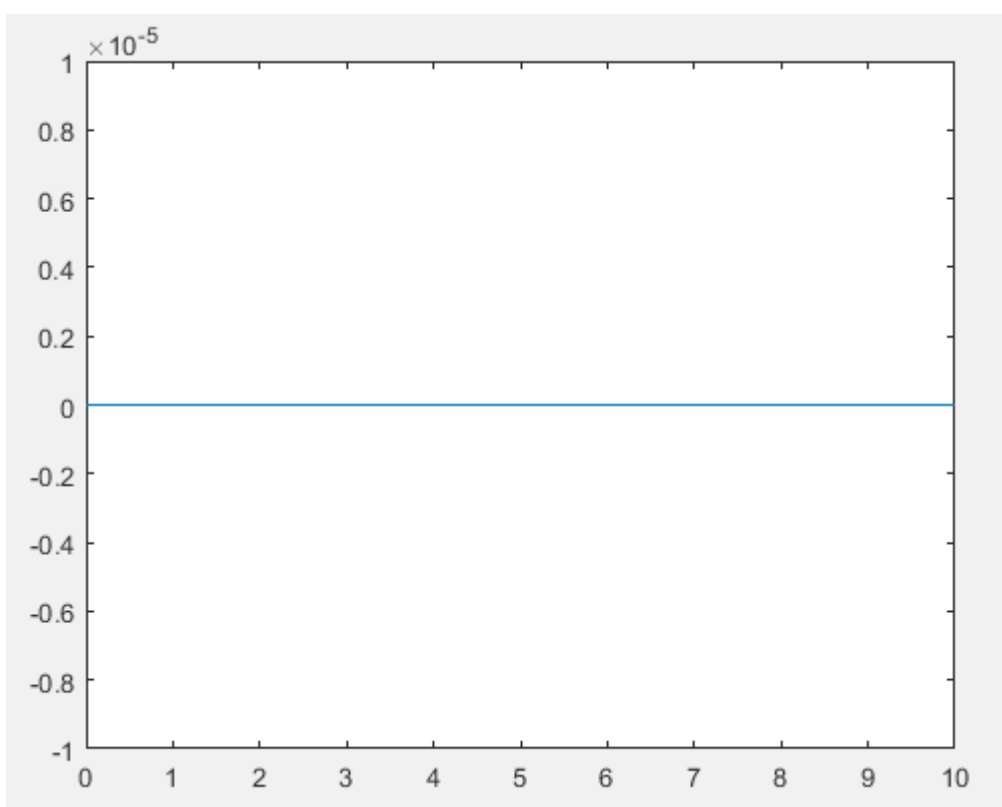
```
figure(1);  
plot(w1,abs(HH));  
legend('metro H(w)');
```



```
figure(2);  
plot(w1,angle(HH));  
legend('fash H(w)');
```



```
diaf=HH-abs(HH).*exp(j*angle(HH));  
figure(3);  
plot(w1,abs(eval(diaf)));  
ylim([-0.00001 0.00001]);
```



Ερώτημα 2ο

```
%2
clear
syms t w;
x=exp(-3*t)*heaviside(t);
y=t*exp(-3*t)*heaviside(t);
X=fourier(x,w);
Y=fourier(y,w);
H=Y/X
h=ifourier(H,t)
```

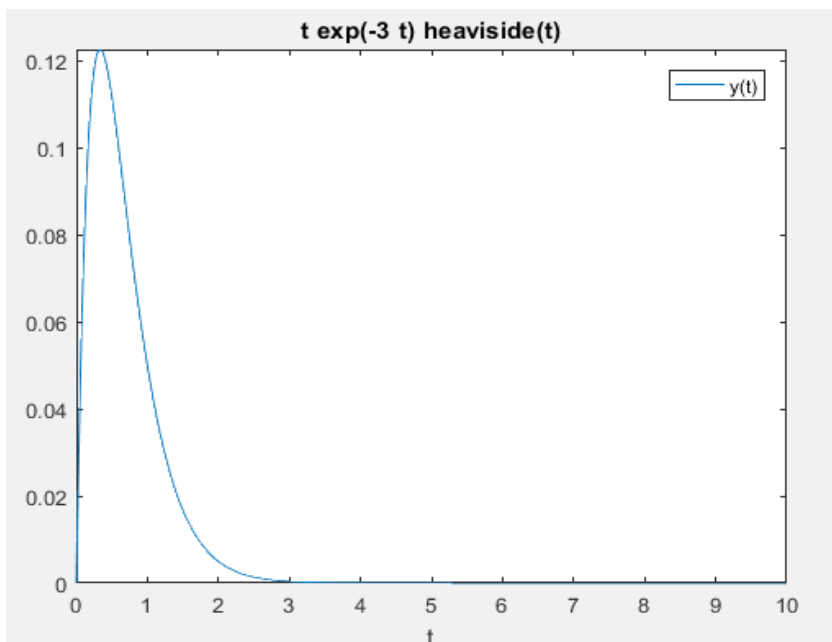
```
H =

1/(3 + w*Ii)

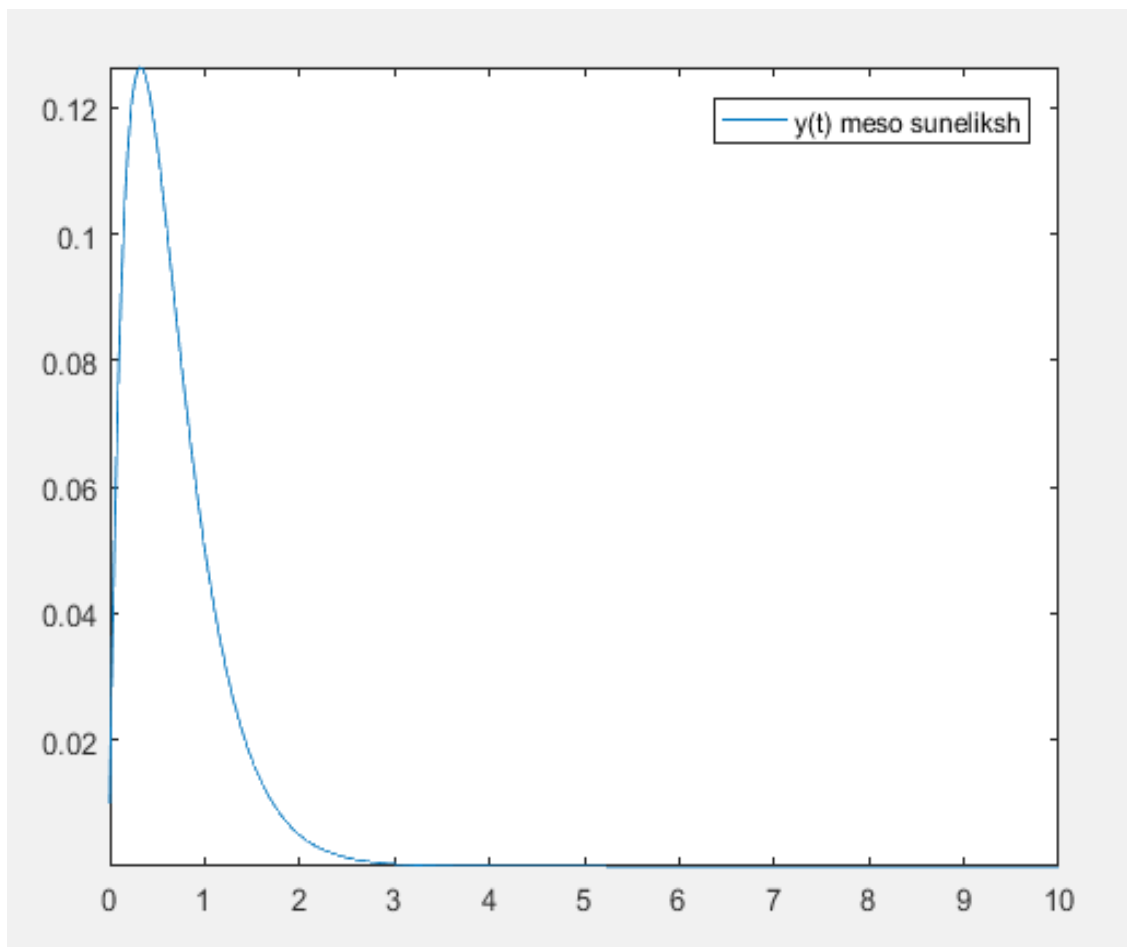
h =

(exp(-3*t)*(sign(t) + 1))/2
```

```
%epivevaiwsh
clear
syms t;
y=t*exp(-3*t)*heaviside(t);
figure(4);
ezplot(y,[0 10]);
axis tight;
legend('y(t)');
```

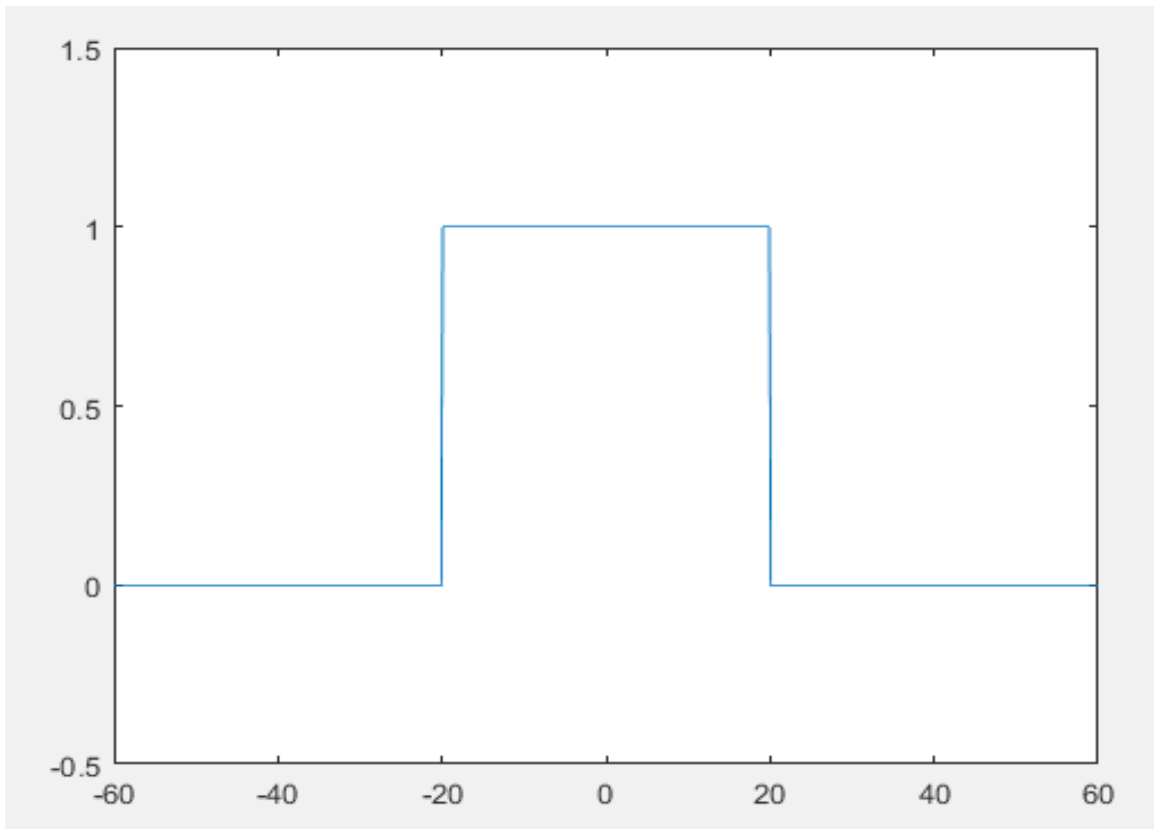


```
%xrhsh synelikshs  
t=0:0.01:5;  
x=exp(-3*t);  
h=x;  
y=conv(x,h)*0.01;  
figure(5);  
plot(0:0.01:10, y);  
axis tight;  
legend('y(t) meso suneliksh');
```



Ερώτημα 3ο

```
%3  
syms t w;  
H=exp(-j*w*8*0.01)*(heaviside(w+20)-heaviside(w-20));  
w1=-60:0.1:60;  
HH=subs(H,w,w1);  
plot(w1,abs(HH));  
ylim([-0.5 1.5]);
```



```
h=ifourier(H,t)
```

```
h =
```

```
((cos(20*t - 8/5)*1i + sin(20*t - 8/5))/(t - 2/25) - (cos(20*t - 8/5)*1i - sin(20*t - 8/5))/(t - 2/25))/(2*pi)
```

```
ezplot(h,[-20 20])  
ylim([-0.3 0.3]);
```

