# Scilab Practical-1 Laplace Transform

Sample Question

**Ques**: .Draw the surface plot of Laplace Transform of following function keeping s=σ+j ω

## Code:

$$f(t) = \begin{cases} \sin(4t+3) & ,0 < t < 5 \\ 0 & ,5 < t \end{cases}$$

```
clear; clc;

t=0:0.01:5;      // function is defined in this range//

f=sin((4*t)+3);

a=1;             //variable chosen to define the loop for sigma //

for sigma=-0.5:0.01:0.5,        //range for sigma is required to plot the graph, //

b=1;                            //variable chosen to define the loop for omega //

for omega =-0.5:0.01:0.5,

rp=f.*exp(-sigma*t).*cos(omega*t);     //real part of integrand e^(-st) f(t) = e^(-(σ+j ω)t) f(t)//

irp(a,b)=inttrap(t,rp);                    //command to find integration of real part of
                                           integrand using  trapezoidal rule//

ip=f.*exp(-sigma*t).*sin(omega*t);         //imaginary part of integrand//

iip(a,b)=inttrap (t,ip);                   //command to find integration of imaginary part of
                                           integrand using  trapezoidal rule//

magnitude (a,b)=abs(irp(a,b)+%i*iip(a,b));   //evaluation of integral including real and
                                             imaginary part//

b=b+1; end;

a=a+1; end;

sigma=-0.5:0.01:0.5;

omega=-0.5:0.01:0.5;

plot3d(sigma,omega,magnitude)              // plot3d is to be used to plot 3 variables

title('ABC123456','fontsize',5)
```

Dear All,

You have to upload the file in the following manner. Name the file as : batch__roll no_first name

# Name

# Batch and Roll no

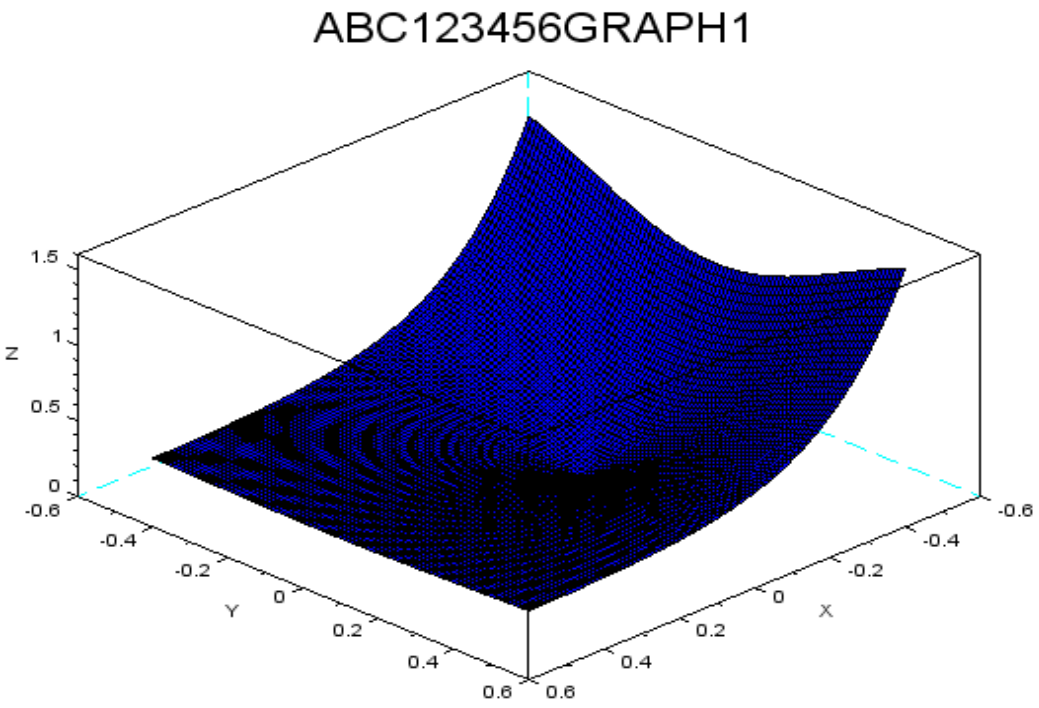
**Ques 1** Draw the surface plot of Laplace Transfrom of following function keeping s=σ+j ω

$$f(t) = \begin{cases} \sin(4t+3) & ,0 < t < 5 \\ 0 & ,5 < t \end{cases}$$

Code on Scinotes :

```
clear; clc;
t=0:0.01:5;   // function is defined in this range//
f=sin((4*t)+3);
a=1;      //variable chosen to define the loop for sigma //
for sigma=-0.5:0.01:0.5,   //range for sigma is required to plot the graph, //
b=1;            //variable chosen to define the loop for omega //
for omega =-0.5:0.01:0.5,
rp=f.*exp(-sigma*t).*cos(omega*t);      //real part of integrand e^(-st) f(t)=e^(-(σ+j ω)t) f(t)//
irp(a,b)=inttrap(t,rp);      //command to find integration of real part of integrand using  trapezoidal rule//
ip=f.*exp(-sigma*t).*sin(omega*t);       //imaginary part of integrand//
iip(a,b)=inttrap (t,ip);              //command to find integration of imaginary part of integrand using  trapezoidal rule//
magnitude (a,b)=abs(irp(a,b)+%i*iip(a,b));   //evaluation of integral including real and imaginary part//
b=b+1; end;
a=a+1; end;
sigma=-0.5:0.01:0.5;
omega=-0.5:0.01:0.5;
plot3d(sigma,omega,magnitude)      // plot3d is to be used to plot 3 variables
title('ABC123456GRAPH1','fontsize',5)
```

# Output:



**Note: to paste the graph, click on copy to clipboard in file in graphic window and give the command paste here.**

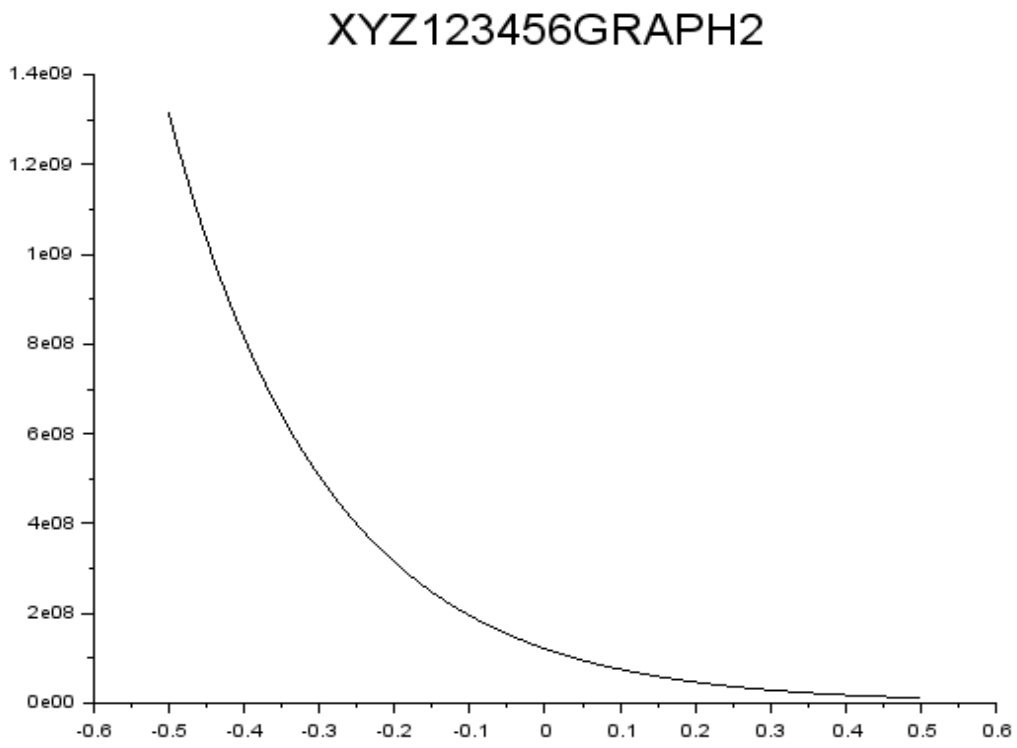
Q.2 .Draw the surface plot of Laplace Transform of following functions keeping s as real

$$f(t) = \begin{cases} e^{4t}, 0 < t < 5 \\ 0, 5 < t \end{cases}$$

Code on Scinotes :

```
clear; clc;
t=0:0.01:5;   // function is defined in this range//
f=exp(4*t);
a=1;      //variable chosen to define the loop for sigma //
for sigma=-0.5:0.01:0.5,   //range for sigma is required to plot the graph, //
rp=f.*exp(-sigma*t);      //real part of integrand e^(-st) f(t)=e^(-(σ+j ω)t) f(t)//
irp(a)=inttrap(t,rp);      //command to find integration of real part of integrand using  trapezoidal rule//
magnitude(a)=abs(irp(a));   //evaluation of integral including real and imaginary part//
a=a+1; end;
sigma=-0.5:0.01:0.5;
plot2d(sigma,magnitude)      // plot2d is to be used to plot 3 variables
title('XYZ123456GRAPH2','fontsize',5)
```

# Output:



Q.3 Draw the surface plot of Laplace Transform of following functions keeping s imaginary

$$f(t) = \begin{cases} sin(4t+3) \, , 0 < t < 5 \\ 0 \, , 5 < t \end{cases}$$

Code on Scinotes :

```
  clear; clc;
t=0:0.01:5;   // function is defined in this range//
f=sin((4*t)+3);
b=1;            //variable chosen to define the loop for omega //
for omega =-0.5:0.01:0.5,
rp=f.*cos(omega*t);      //real part of integrand e^(-st) f(t)=e^(-(σ+j ω)t) f(t)//
irp(b)=inttrap(t,rp);      //command to find integration of real part of integrand using  trapezoidal rule//
ip=f.*sin(omega*t);       //imaginary part of integrand//
iip(b)=inttrap (t,ip);              //command to find integration of imaginary part of integrand using  trapezoidal rule//
magnitude (b)=abs(irp(b)+%i*iip(b));   //evaluation of integral including real and imaginary part//
b=b+1; end;
omega=-0.5:0.01:0.5;
plot2d(omega,magnitude)      // plot3d is to be used to plot 3 variables
title('ABC123456GRAPH3','fontsize',5)
```