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Batch: A – A3

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Question 1:

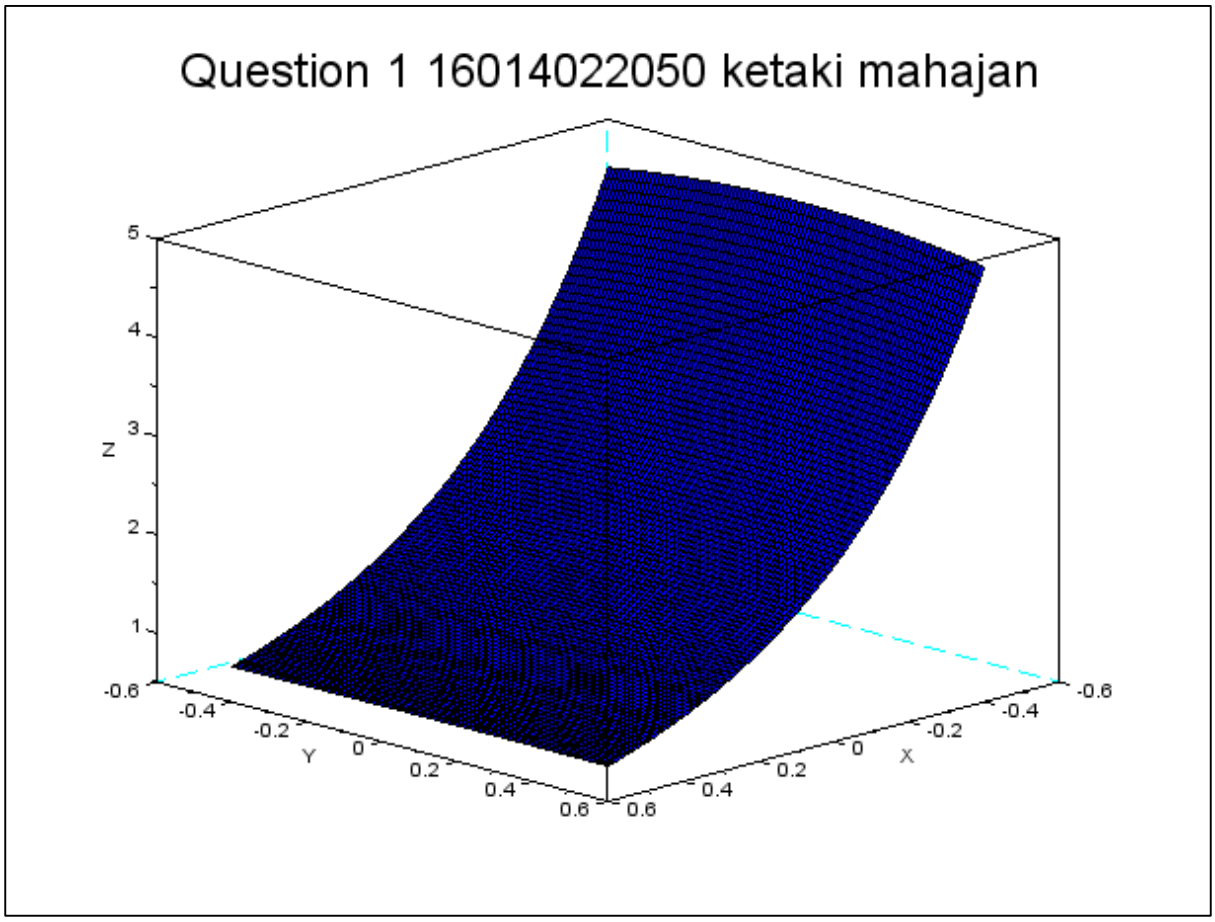
Draw the surface plot of Laplace Transfrom of following function keeping s = σ+j ω.

$$f(t) = \begin{cases} \cos(t-2), & 0 < t < 3 \\ 0, & t > 3 \end{cases}$$

Code

```
clear; clc;
t=0:0.01:3; // function is defined in this range//
f=cos(t-2);
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('Question 1 16014022050','fontsize',5)
```

Output



Question 2:

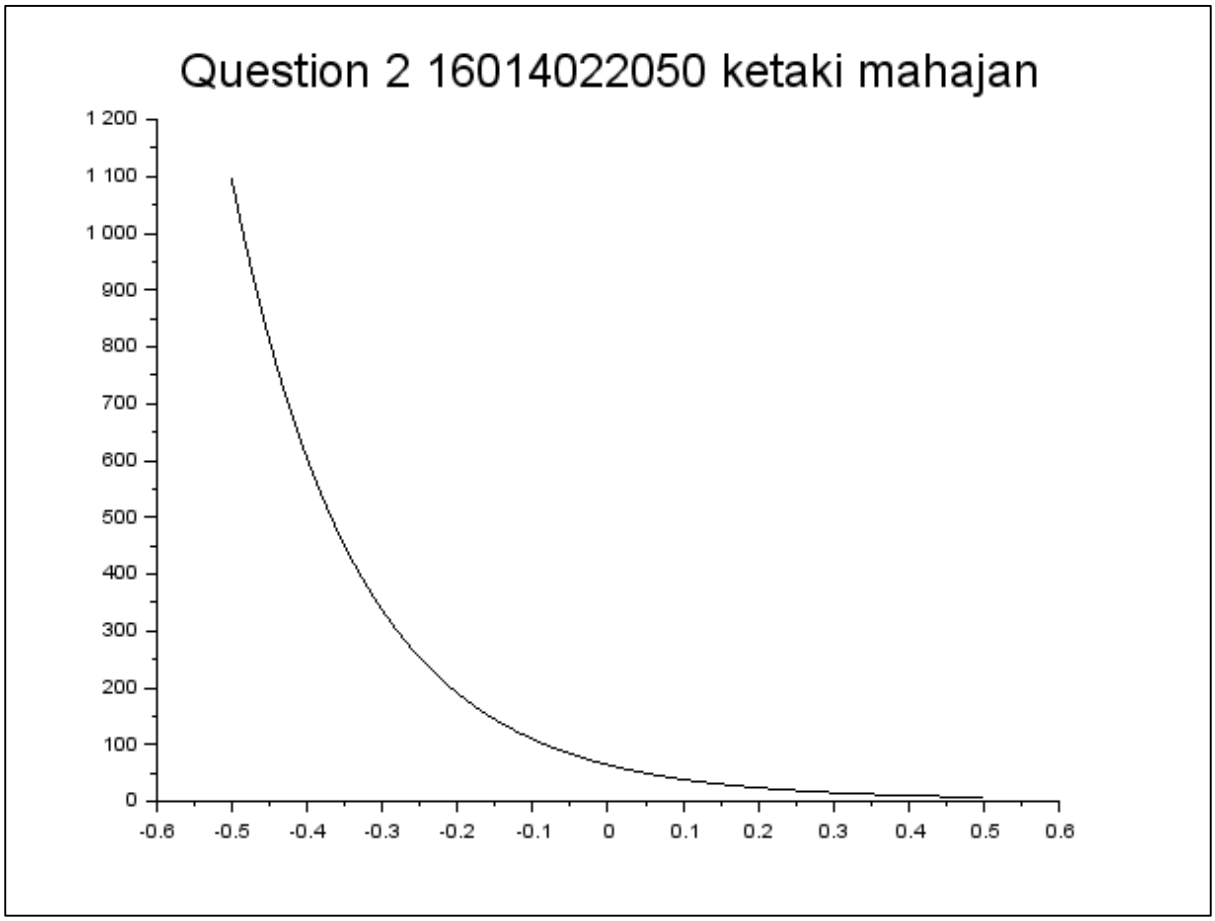
Draw the surface plot of Laplace Transform of following functions keeping s as real.

$$f(t) = \begin{cases} e^{\frac{t}{2}}, & 0 < t < 7 \\ 0, & t > 7 \end{cases}$$

Code

```
clear; clc;
t=0:0.01:7; // function is defined in this range//
f=exp(t/2);
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('Question 2 16014022050 ketaki mahajan','fontsize',5)
```

Output


Question 2 16014022050 ketaki mahajan
1 200
1 100
1 000
900
800
700
600
500
400
300
200
100
0
-0.6
-0.5
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6