Department of Mathematics

School of Advanced Sciences

MAT 1011 – Calculus for Engineers (MATLAB)

Experiment 2–B

Laplace transforms, Inverse Laplace transform

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**Question 1(i)**

**Write the MATLAB code to find the Laplace transform of f(t) **

CODES:

clear

close all

clc

syms t

f=input('Enter the function');

F=laplace(f);

disp('The laplace transform of the given function is')

disp(F)

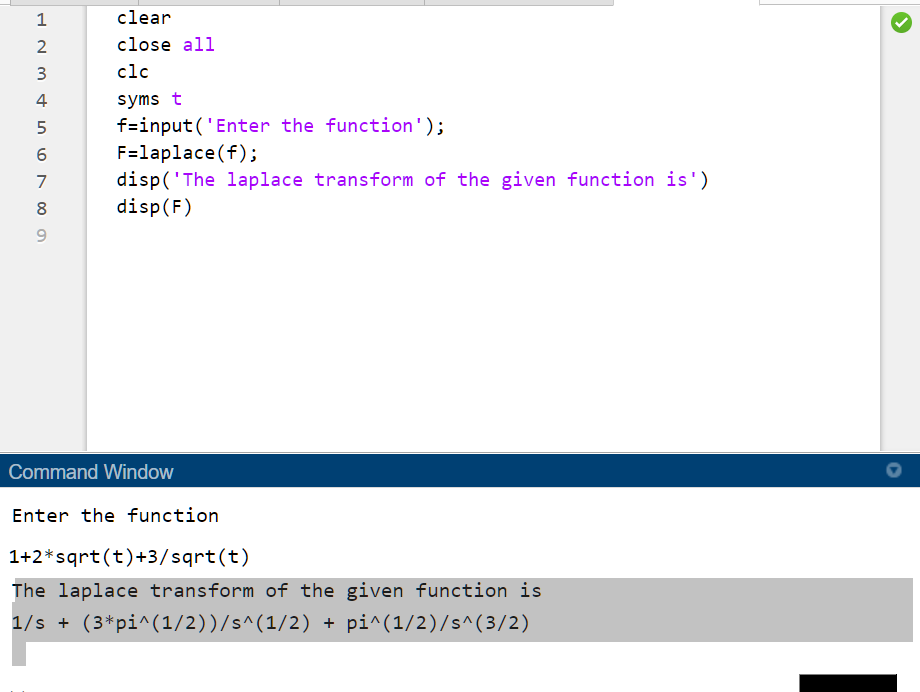
INPUT:

Enter the function

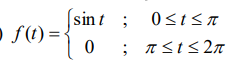
1+2\*sqrt(t)+3/sqrt(t)

OUTPUT:

The laplace transform of the given function is  
1/s + (3\*pi^(1/2))/s^(1/2) + pi^(1/2)/s^(3/2)



**Question 1(ii)**

**Write the MATLAB code to find the Laplace transform of f(t)**

**Code :**

clear

close all

clc

syms t

f=input('Enter the function');

F=laplace(f);

disp('The laplace transform of the given function is')

disp(F)

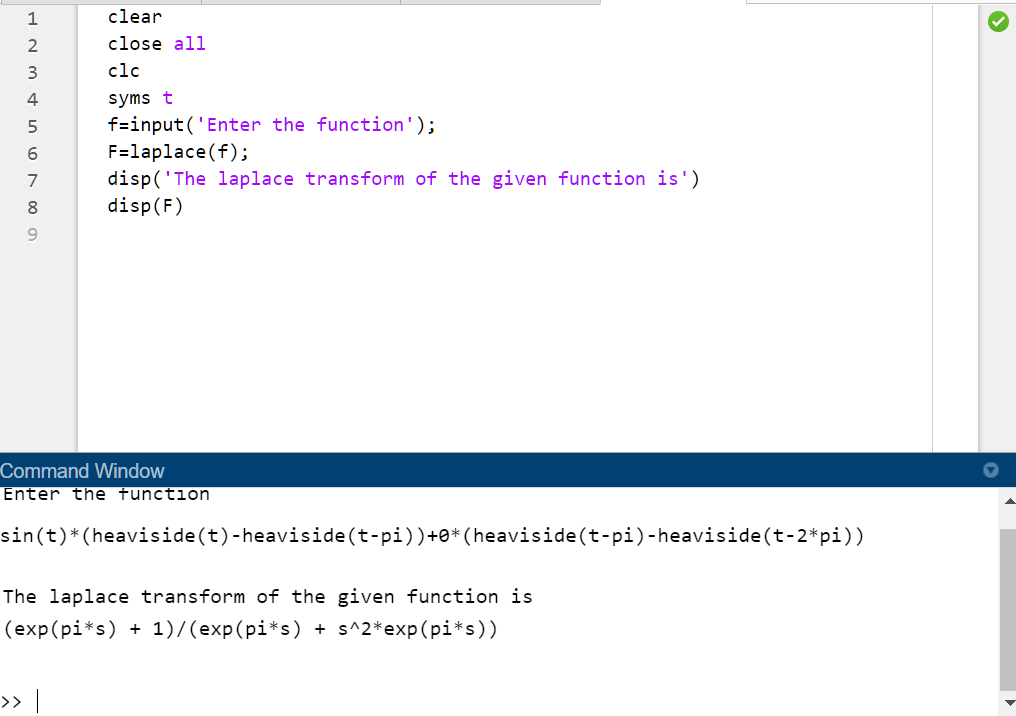
**INPUT:**

Enter the function

sin(t)\*(heaviside(t)-heaviside(t-pi))+0\*(heaviside(t-pi)-heaviside(t-2\*pi))

**OUTPUT:**

The laplace transform of the given function is  
(exp(pi\*s) + 1)/(exp(pi\*s) + s^2\*exp(pi\*s))



**Question 1(iii):**

**Write the MATLAB code to find the Laplace transform of**

Codes:

clear

close all

clc

syms t

f=input('Enter the function');

F=laplace(f);

disp('The laplace transform of the given function is')

disp(F)

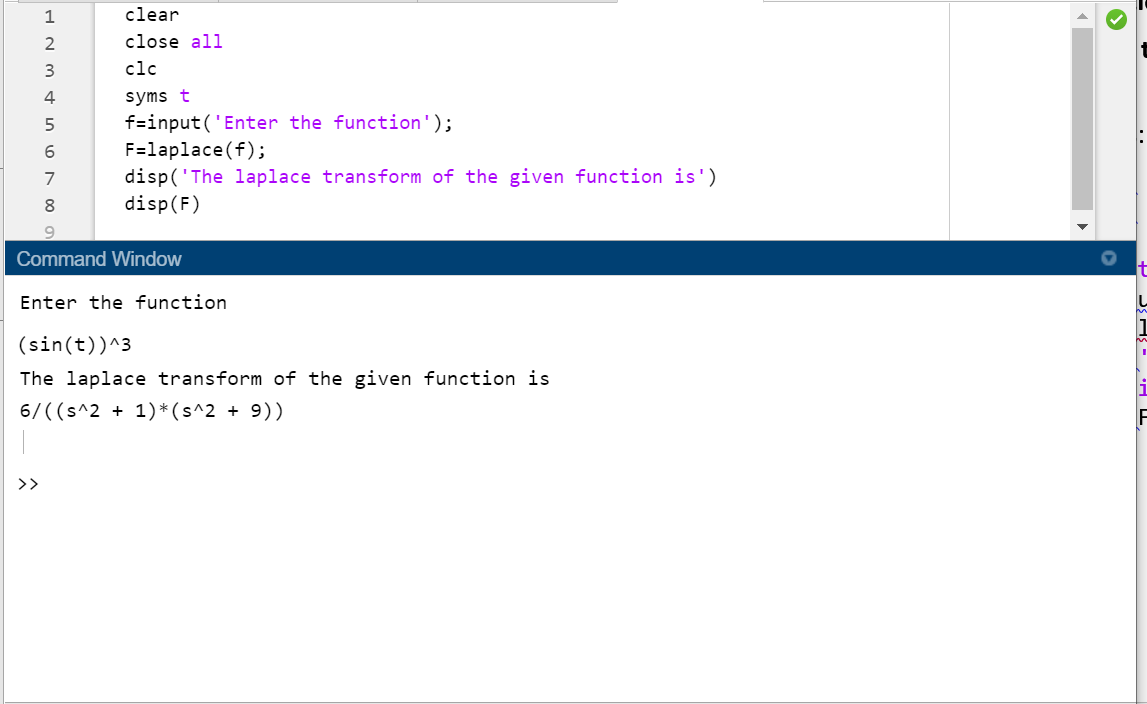
INPUT:

Enter the function

(sin(t))^3

OUTPUT:

The laplace transform of the given function is  
6/((s^2 + 1)\*(s^2 + 9))



**Question 1(IV):**

**Write the MATLAB code to find the Laplace transform of**

Codes:

clear

close all

clc

syms t

f=input('Enter the function');

F=laplace(f);exp()

disp('The laplace transform of the sin(2t)given function is')

disp(F)

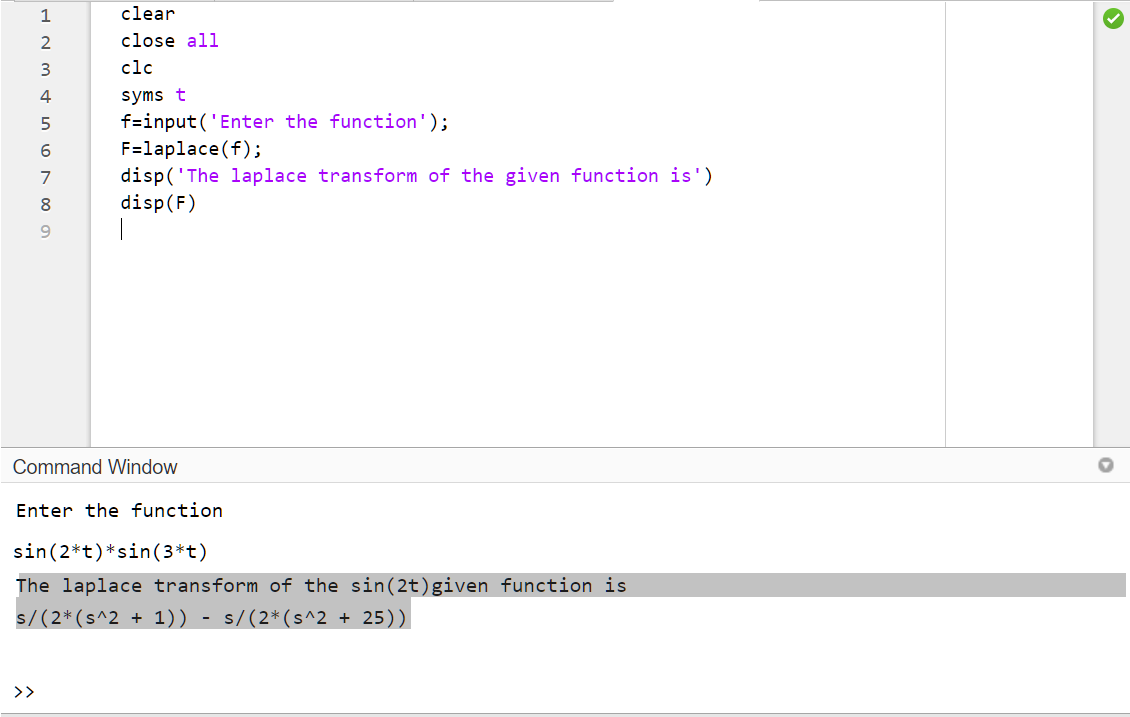
**INPUT:**

Enter the function

sin(2\*t)\*sin(3\*t)

**OUTPUT:**

**The laplace transform of the given function is  
s/(2\*(s^2 + 1)) - s/(2\*(s^2 + 25))**

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**Question 1(v):**

**Write the MATLAB code to find the Laplace transform of**

Codes:

clear

close all

clc

syms t

f=input('Enter the function');

F=laplace(f);

disp('The laplace transform of the given function is')

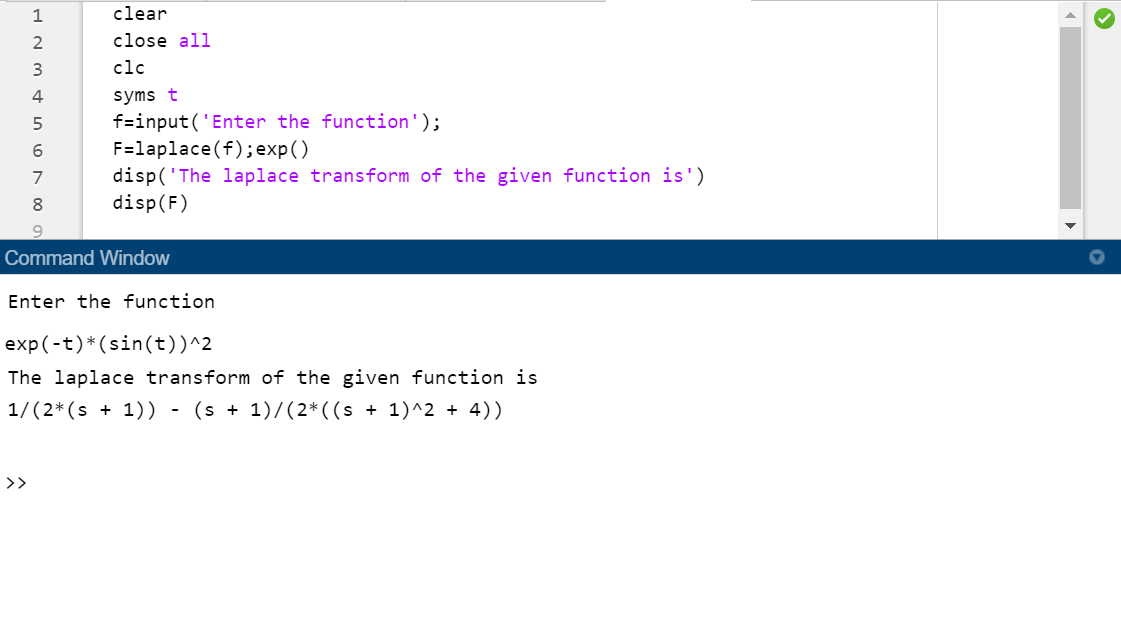
disp(F)

Input:

Enter the function

exp(-t)\*(sin(t))^2

Output:

The laplace transform of the given function is  
1/(2\*(s + 1)) - (s + 1)/(2\*((s + 1)^2 + 4))  
 

**Question 1 (vi):**

**Write the MATLAB code to find the Laplace transform of**

Codes:

clear

close all

clc

syms t

f=input('Enter the function');

F=laplace(f);

disp('The laplace transform of the given function is')

disp(F)

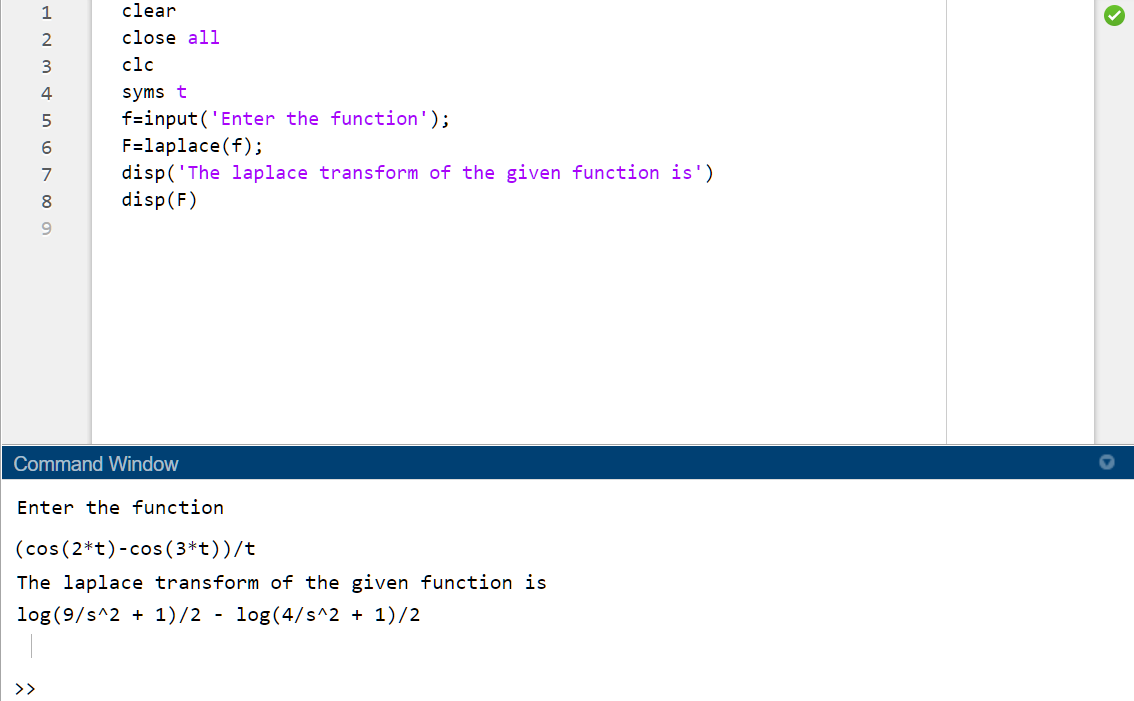
**INPUT:**

Enter the function

(cos(2\*t)-cos(3\*t))/t

**OUTPUT:**

The Laplace transform of the given function is  
log(9/s^2 + 1)/2 - log(4/s^2 + 1)/2



**Question number 2(i)**

**Find the inverse Laplace transforms of the following functions:**

**CODE:**

clear

close all

clc

syms s a

F=input('Enter the function of s to calculate its laplace inverse:');

f=ilaplace(F);

disp('The inverse laplace of the given function is :')

disp(f);

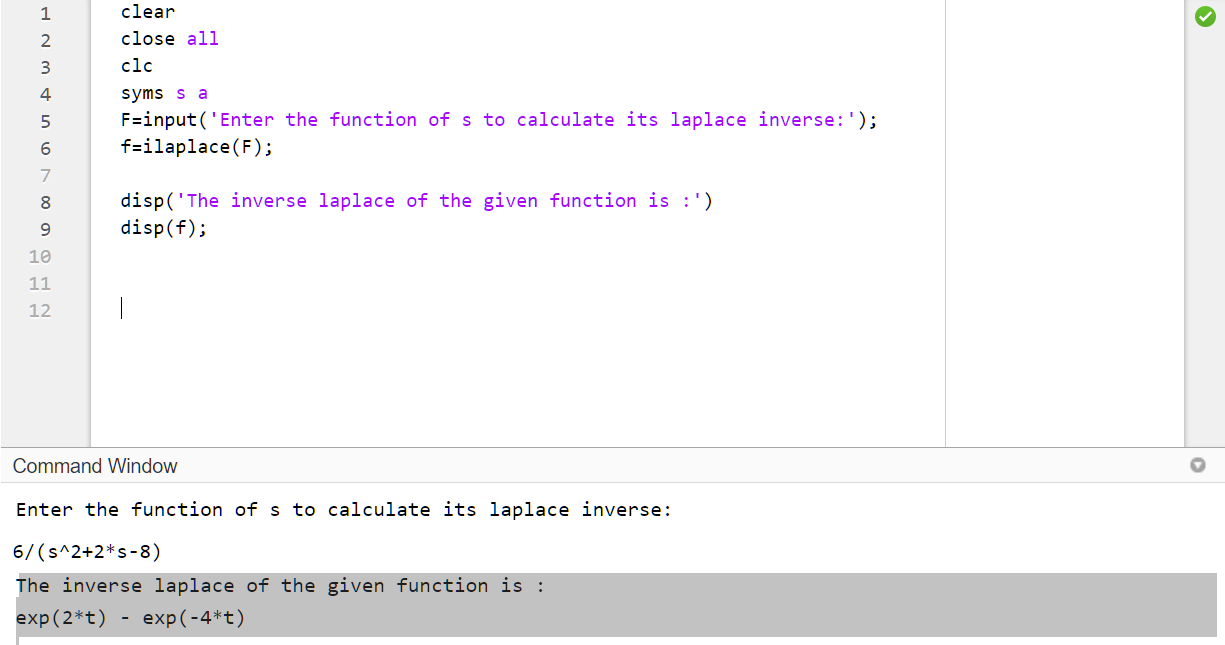
**INPUT:**

Enter the function of s to calculate its laplace inverse:

6/(s^2+2\*s-8)

**OUTPUT:**

The inverse laplace of the given function is :  
exp(2\*t) - exp(-4\*t)

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**Question number 2(ii)**

**Find the inverse Laplace transforms of the following functions:**

**Codes:**

clear

close all

clc

syms s a

F=input('Enter the function of s to calculate its laplace inverse:');

f=ilaplace(F);

disp('The inverse laplace of the given function is :')

disp(f);

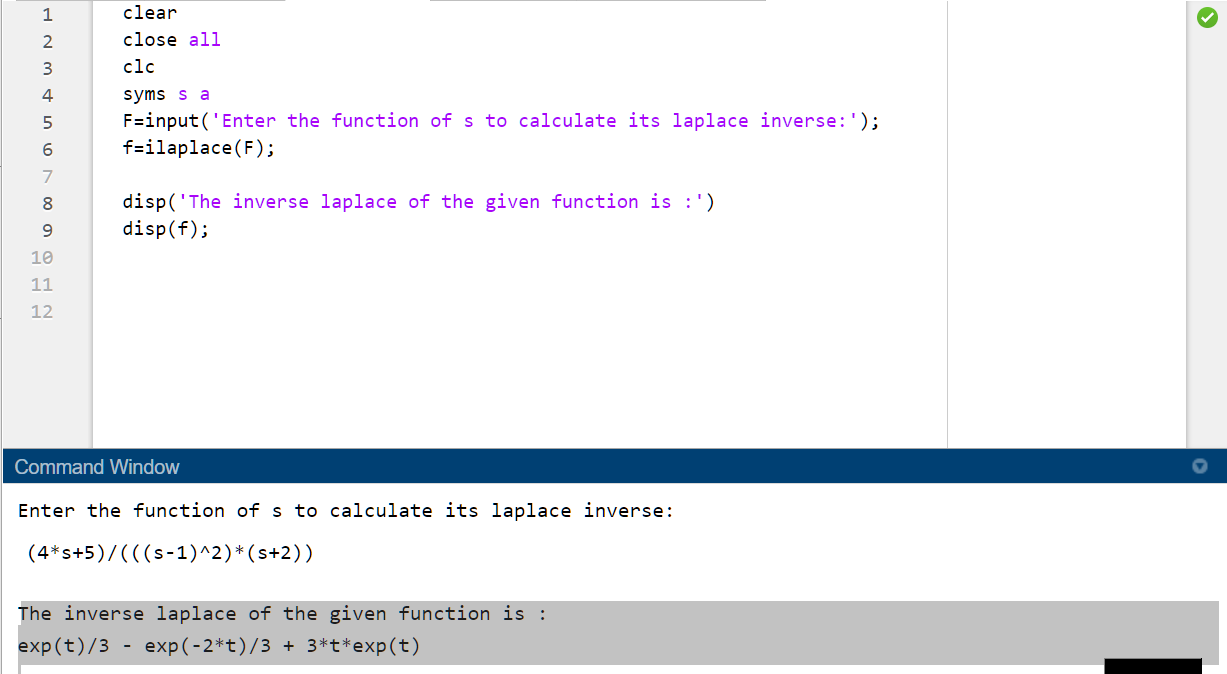
**INPUT:**

Enter the function of s to calculate its laplace inverse:

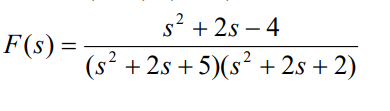
(4\*s+5)/(((s-1)^2)\*(s+2))

**OUTPUT:**

The inverse laplace of the given function is :  
exp(t)/3 - exp(-2\*t)/3 + 3\*t\*exp(t)

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**Question number 2(ii)**

**Find the inverse Laplace transforms of the following functions** 

**CODES:**

clear

close all

clc

syms s a

F=input('Enter the function of s to calculate its laplace inverse:');

f=ilaplace(F);

disp('The inverse laplace of the given function is :')

disp(f);

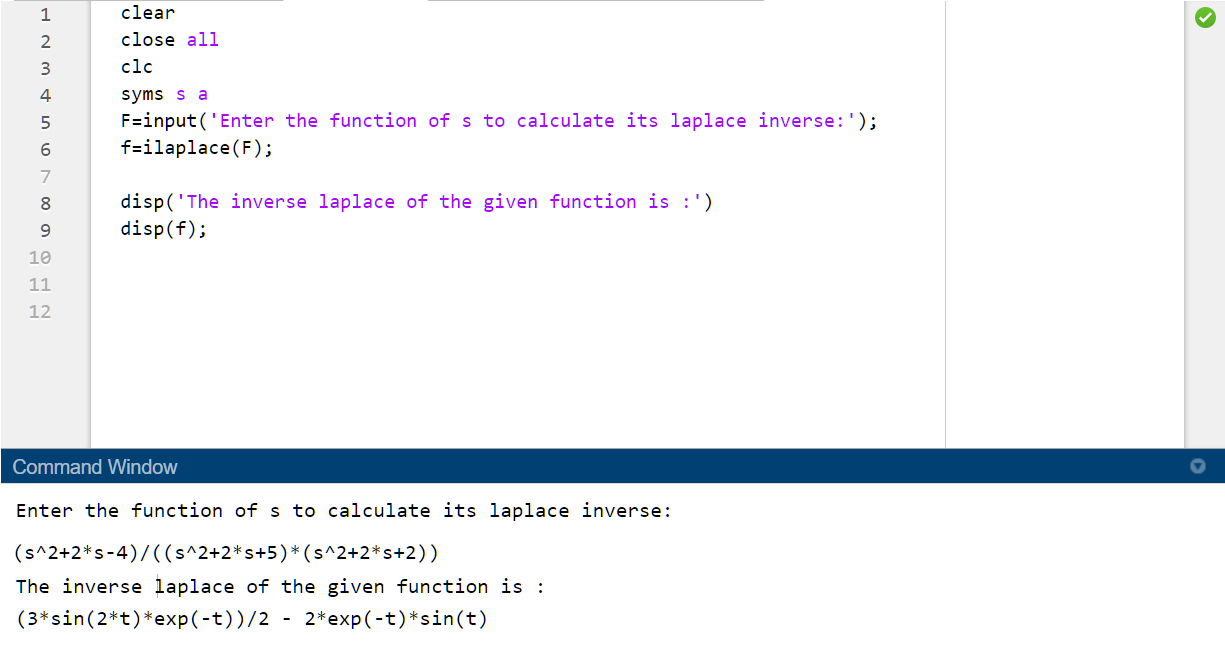
**INPUT:**

Enter the function of s to calculate its laplace inverse:

(s^2+2\*s-4)/((s^2+2\*s+5)\*(s^2+2\*s+2))

**OUTPUT:**

The inverse laplace of the given function is :  
(3\*sin(2\*t)\*exp(-t))/2 - 2\*exp(-t)\*sin(t)



***THANK YOU***