MAT1011 – Calculus for Engineers (MATLAB), Fall Semester 2020-2021

Digital Assignment SL. 4, Experiment – 2b: Laplace transforms, Inverse Laplace Transforms.

By: Jonathan Rufus Samuel (20BCT0332) Date: 28.11.2020

Q1.1) Find the Laplace transform of the function: f(t) = 1 + 2√t + 3/√t

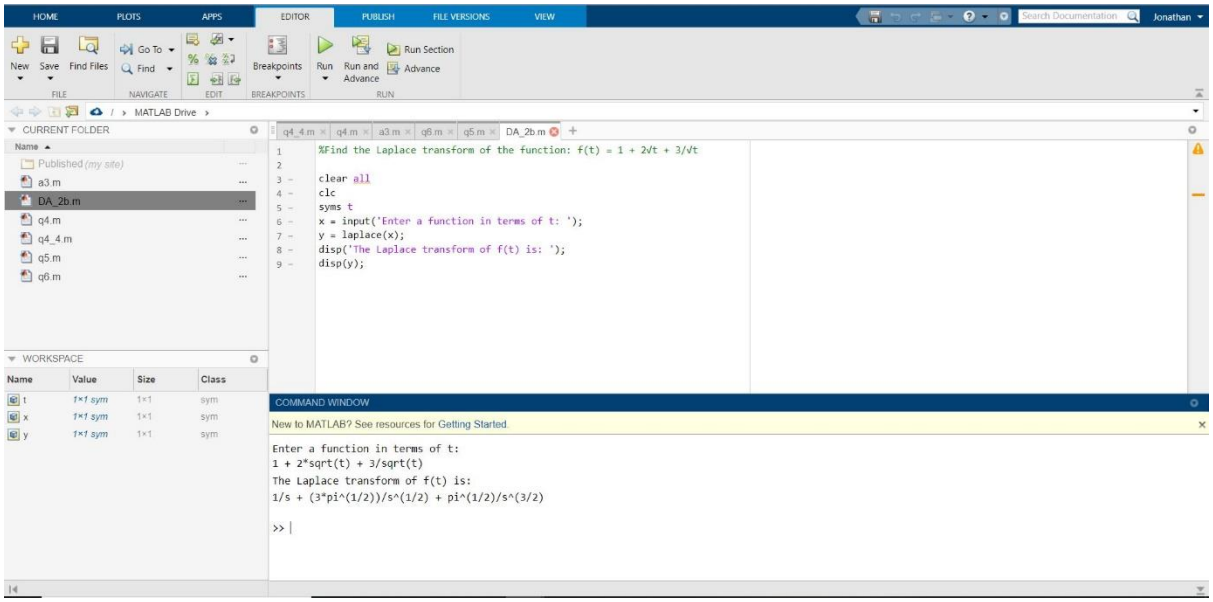
A: Code is as follows:

```
%Find the Laplace transform of the function: f(t) = 1 + 2√t + 3/√t


clear all
clc
syms t
x = input('Enter a function in terms of t: ');
y = laplace(x);
disp('The Laplace transform of f(t) is: ');
disp(y);
```

Output (via Command Window):

```
Enter a function in terms of t:
1 + 2*sqrt(t) + 3/sqrt(t)
The Laplace transform of f(t) is:
1/s + (3*pi^(1/2))/s^(1/2) + pi^(1/2)/s^(3/2)
```



Q1.2) Find the Laplace transform of the function: f(t) = (cos2t-cos3t)/t

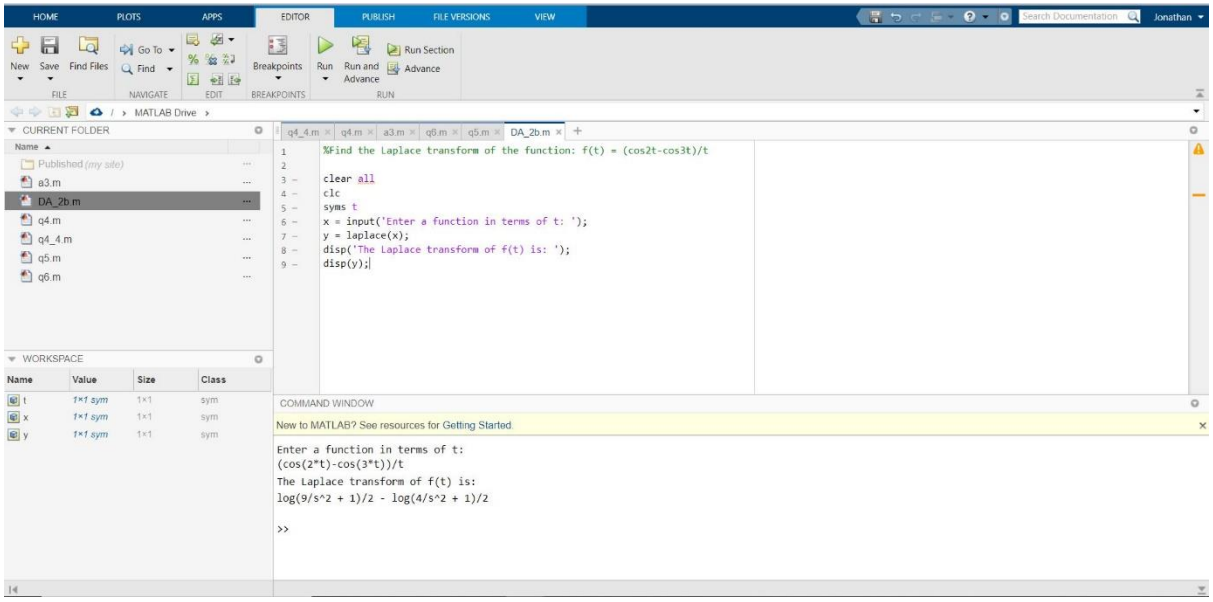
A: Code is as follows:

```
%Find the Laplace transform of the function: f(t) = (cos2t-cos3t)/t


clear all
clc
syms t
x = input('Enter a function in terms of t: ');
y = laplace(x);
disp('The Laplace transform of f(t) is: ');
disp(y);
```

Output (via Command Window):

```
Enter a function in terms of t:
(cos(2*t)-cos(3*t))/t
The Laplace transform of f(t) is:
log(9/s^2 + 1)/2 - log(4/s^2 + 1)/2
```



Q2.1) Find the inverse Laplace transform of the function: f(s) = 6/(s^2+2s-8)

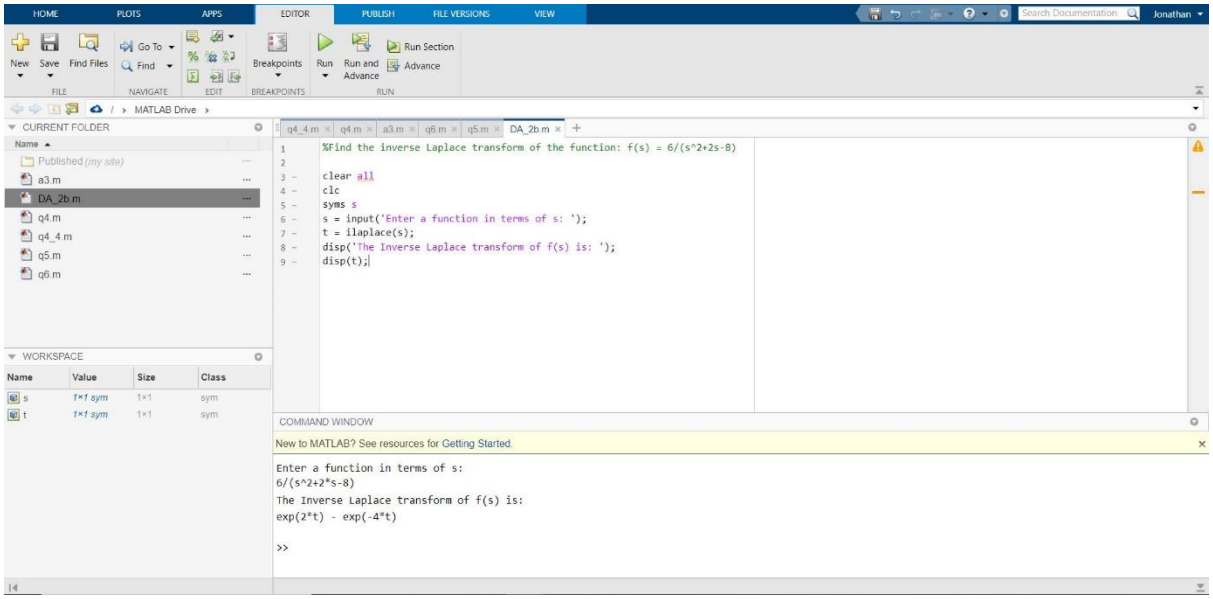
A: Code is as follows:

```
%Find the inverse Laplace transform of the function: f(s) = 6/(s^2+2s-8)


clear all
clc
syms s
s = input('Enter a function in terms of s: ');
t = ilaplace(s);
disp('The Inverse Laplace transform of f(s) is: ');
disp(t);
```

Output (via Command Window):

```
Enter a function in terms of s:
6/(s^2+2*s-8)
The Inverse Laplace transform of f(s) is:
exp(2*t) - exp(-4*t)
```



Q2.2) Find the inverse Laplace transform of the function: f(s) = 4s+5/(((s-1)^2)*(s+2))

A: Code is as follows:

```
%Find the inverse Laplace transform of the function:
% f(s) = ((4*s)+5)/(((s-1)^2)*(s+2))


clear all
clc
syms s
s = input('Enter a function in terms of s: ');
t = ilaplace(s);
disp('The Inverse Laplace transform of f(s) is: ');
disp(t);
```

Output (via Command Window):

```
Enter a function in terms of s:
((4*s)+5)/(((s-1)^2)*(s+2))
The Inverse Laplace transform of f(s) is:
exp(t)/3 - exp(-2*t)/3 + 3*t*exp(t)
```