Table of Contents

..... 1
Commands learned 1
Inlab 1
Laplace Transformation 1
Plot and Laplace Transformation 2
Partial Fraction Expansion 2
Inverse Laplace Transformaton 3
Inverse Laplace Transformation 3


```
% Anthony Rosenblum
% EELE 203
% 5/29/2018
% Lab 5 Memo
```

Commands learned

```
% syms x y z - create system variables
% residue(num,den) - calculates the partial fraction expansion of a
 ratio
% of polynomials
% tf(num,den) - obtain transfer function given a laplace
 transformation
% ratio
% step - computes the step response
% impulse - computers the impulse response
% bode(num,den) - plots the bode plot for a given trasnfer functoin
% laplace(f(t)) - performs laplace transformation of system variable
 function
% ilaplace(f(s)) - performs inverse laplace transformation of s
 variable
% function
```

Inlab

Laplace Transformation

1

```
syms s x y z d t;

laplace(t^2 * cos(3*t) * heaviside(t))
```

ans =

*(8*s^3)/(s^2 + 9)^3 - (6*s)/(s^2 + 9)^2*

Plot and Laplace Transformation

2

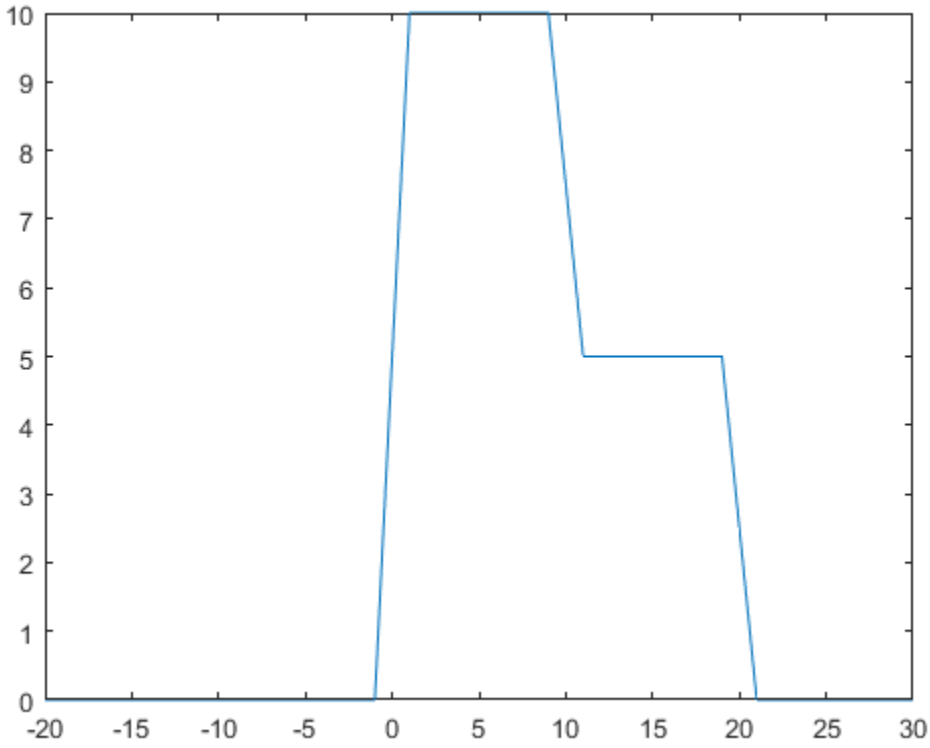
```
laplace(10*heaviside(t) -10 * heaviside(t-10) + 5 * heaviside(t-10) -
 5 * heaviside(t-20))

w = [-20:1:30];
com1 = 10*heaviside(w) -10 * heaviside(w-10) + 5 * heaviside(w-10) - 5
 * heaviside(w-20);

plot(w,com1)
```

ans =

*10/s - (5*exp(-20*s))/s - (5*exp(-10*s))/s*



Partial Fraction Expansion

3

```
num = [0 1 2 0 6];
den = [1 5 7 3 0];
```

```
[r,p,k] = residue(num,den)
```

```
r =

    0.2500
   -1.2500
   -3.5000
    2.0000


p =

   -3.0000
   -1.0000
   -1.0000
         0


k =

     []
```

Inverse Laplace Transformaton

```
4
```

```
ilaplace( (s^3 + 2*s^2 + 6)/(s*(s+1)^2 * (s+3)))
```

```
ans =

exp(-3*t)/4 - (5*exp(-t))/4 - (7*t*exp(-t))/2 + 2
```

Inverse Laplace Transformation

```
5
```

```
ilaplace(-225/(s+t) + 105/(s+3) + 810/(s+3)^2 + 120/s)
```

```
ans =

105*exp(-3*t) - 225*exp(-t^2) + 810*t*exp(-3*t) + 120
```

Published with MATLAB® R2017a