4c) Matlab Mfile Program to Convert

$f(s) = ke^{-at} \sin(3\omega t) \cos 3\omega t$

And $f(s) \frac{1}{(s^2 + 15\pi s + 24\pi^3)}$

```
Command window
Clear
Cle
Syms k w t s f(t) f(s) a
2 = k' exp (a*t*sin (3x w*t) cos (3x w*t)
laplace (2)!
```

```
Command window
Clear
Clc
Syms f(s)
a = (3.142) (3^2) + 15* 3.142 * 3 + 24 * (3.142^3)
laplace (x)
```

6.

Command window

Clc

Clear

Close

```
Syms x(t) y(t)
equ1 = diff (y,t) - 2 * x = = exp(-2* t);
equ2 = diff (x,t) + y - exp(-t)
equs = [equ1, equ2]
Cond = x(0) = = 0, y(0) = = 0
  Ans = dsolve (equs, Cond)
  x Sol (t) = Ans x
  y sol (t) = Ans y
```

Visualizing the Solution On Graph Separating Continue with

```
f Plot (x sol)
f Plot (y Sol)
grid on
legend ('x Sol'; location', best')
legend ('y Sol" ;location, 'best)
```

Visualizing the Solution On Graph together Continue with

```
f Plot (x sol)
hold on
f Plot (y sol)
grid on
legend {'x Sol', 'ySol', 'location', 'best'}.
```

Name: Lumumba Ebiakpo Emmanuel
17/ENG06/052
ENG 381

Question 4a.

Command window

```
Clc
Clear all
Syms n(t)
D = diff (n)
Ode = (diff (n,t,2) - (diff (n,t)) - (2*n)
      = = 144*(t^3)+12.5;
Cond1 = D(0) = -0.5
Cond2 = n(0) = = 5;
Cond 3 = [Cond1, Cond2];
dsolu(t) = desolve (ode, Conds);
dsol = Simplify (dsu(t))
tn = [0:0.1:1.5]
Togn = Subs (dsol, tn)
Plot (tn, Emma)
Grind On
```