

10) `clear`

`clc`

`clear`

`close`

`syms x(t) y(t)`

`eqn1 = diff(y,t) - 2*x == 0*exp(-2*t);`

`eqn2 = diff(x,t) + y == exp(-t);`

`eqn3 = [eqn1, eqn2]`

`cond = x(0) == 0, y(0) == 0`

`Ans = dsolve(eqn3, cond)`

`x_sol(t) = Ans.x`

`y_sol(t) = Ans.y`

Visualizing the solution on graph `separate`

`F plot(x_sol)`

`F plot(y_sol)`

`grid on`

`legend('x_sol', 'location', 'best')`

`legend('y_sol', 'location', 'best')`

ii) Visualizing the solution on graph together `contour` with

`F Plot(x_sol)`

`hold on`

`F Plot(y_sol)`

`grid on`

`legend('x_sol', 'y_sol', 'location', 'best')`

4jc

matlab mfile program to convert
 $f(t) = k e^{-at} \sin(\omega t) \cos 3\omega t$
and $F(s) = \frac{k}{(s^2 + 15\pi s + 24\pi^3)}$

- 1 - Command window
- 2 - Clear
- 3 - clc
- 4 - Syms k w t s F(t) F(s) a
- 5 - Z = k * exp(-a * t * sin(s * w * t) * cos(3 * w * t)
- 6 - laplace(Z)

- 1 - Command window
- 2 - Clear
- 3 - clc
- 4 - Syms F(s) = .
- 5 - u = (3.142) / ((s^2) + 15 * 3.142 * s + 24 * (3.142^3))
- 6 - laplace(u)

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Question 4c)

1) - Command window

2 - clic

3 - Close all

4 - syms n(t)

5 - D = diff(n

6 - ode = (diff(n, t, 2)) - (diff(n, t)) - (12 * n) == 144 * t ^ 3 + 12 * s;

7 - cond1 = D(0) == -0.5;

8 - cond2 = n(0) == 5;

9 - conds = [cond1 cond2];

10 - dsol(t) = solve(ode, conds);

11 - dsol = simplify(dsol(t))

12 - tn = [0:0.1:1.5]

13 - femmy = subs(dsol, tn)

14 - plot(tn, femmy

15 - grid on

