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Dept: Mechanical

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Question 49

Command window

clc

clear

close all

sym('n')

eqn = diff('n(t,2)') - diff('n(t)') - 12\*n = 144\*(t^3) + 12\*t^5;

Concl = n(0) = 5, diff('n(t,2)') = -0.9;

Ysol = dsolve(eqn, Concl)

t = 0:0.1:1.5

Delight = Subs(Ysol)

Fplot(Delight)

grid on

legend('Delight', 'Location','best')

Question 48

Command window

clc

clear

close

Syms x(t) y(t)

Eqn1 = diff('x(t)') - 2\*x == exp(-2\*t);

Eqn2 = diff('y(t)') + 7\*y == exp(-t);

Eqns = [Eqn1; Eqn2]

Concl = x(0) == 0, y(0) == 0;

Ans = dsolve(Eqns, Concl)

Xsol(t) = Ans.x

Ysol(t) = Ans.y

(ii) Visualizing the solution on graph separately continue with

Fplot (x\_sol)

Fplot (y\_sol)

grid on

legend ('x\_sol', 'Location', 'best')

legend ('y\_sol', 'Location', 'best')

(iii) Visualizing the solution on graph together continue with

Fplot (x\_sol)

hold on

Fplot (y\_sol)

grid on

legend ('x\_sol', 'y\_sol', 'Location', 'best')

### Question 4c

i) Command window

clc

clear

close all

Syms t, s, w, x, A, q

$x = M \cdot \exp(-A \cdot t) + \sin(S \cdot W \cdot t) + \cos(B \cdot W \cdot t)$

F = Laplace (x, t, s)

Simplify (F)

Pretty (ans)

ii) Command window

clc

clear

close all

Syms t, s

$F = P_1 \cdot / (C \cdot S^2) + 15 \cdot P_1 \cdot S + 24 \cdot (P_1 \cdot^3)$

iLaplace (F)

Simplify (ans)

Pretty (ans)