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18/ENG04/078

Elect/Elect

Assignment

(4a)

Command window

clc

close all

syms n(t)

D = diff(n)

ode = (diff(n, t, 2)) - diff(n, t) - 12*n == 144*t^3 + 10.5

cond1 = D(0) == -0.5;

cond2 = n(0) == 5;

conds = [cond1, cond2]

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

dsol = simplify(dsol(t))

tn = 0:0.1:1.5

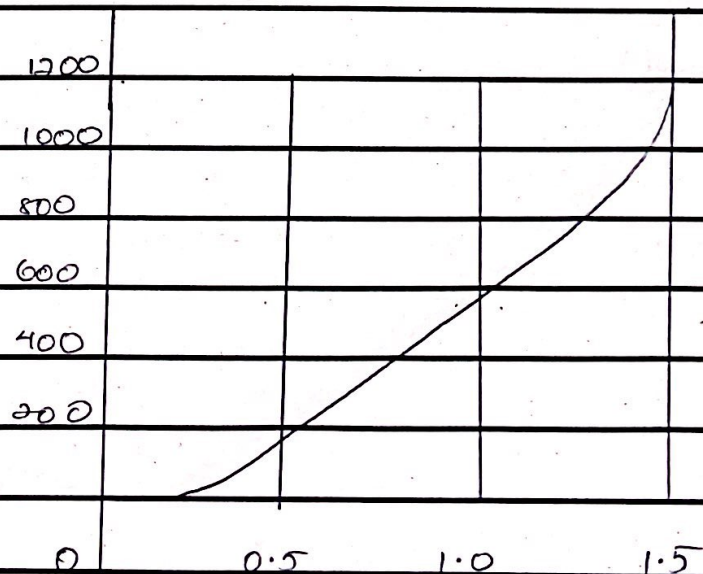
dauid = subs(dsol, tn)

plot(tn, dauid)

grid on

grid minor

axis tight



(b) Command window

clear

clc

syms y(t) yx(t)

Dy = diff(y,t)

Dx = diff(yx,t)

equ1 = Dy = -exp(-2*t) + 2*4

equ2 = Dx = -exp(-1*t) - y

ode = (equ1:equ2)

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

Ans = solve(ode, cond)

x_sol(t) = Ans.x

y_sol(t) = Ans.y

tplot(x_sol(t))

fplot(y_sol(t))

grid on

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

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

fplot(x_sol)

hold on

fplot(y_sol)

grid on

(4) command window

clear all

clc

syms t(s)

$$F(s) = (3 \cdot 142) / (s^2) + 15 \cdot 3 \cdot 142 \cdot s + 124 \cdot (3 \cdot 142 \cdot 13)$$

laplace(f, s)

command window

clear all

clc

syms t(s) k w t a

$$f(t) = k \cdot \exp(-a \cdot t) \cdot \sin(5 \cdot w \cdot t) \cdot \cos(3 \cdot w \cdot t)$$

laplace(f, t)

N.U.E.S.A