

PIRANO-SHEEPACK

17 (exercises)

mechanical engineering

Exer 36: average (t)

444 Command window

clc

clear all

syms n(t)

D = diff(n)

ode = (diff(n,t)) - (n^2) - (n^3)

== 1000*(t^3) + 1000

cond1 = D(0) = 0.5;

cond2 = n(0) = 0.5;

[conds] = [cond1 cond2];

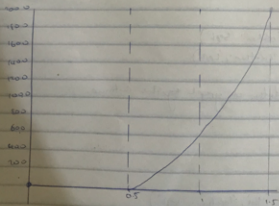
[soln] = dsolve(ode, conds);

tn = [0:0.1:1.5];

sheltrack = subs(soln, tn);

plot(tn, sheltrack)

grid on



④ Command window

clc

clear

close

syms x(t) y(t)

eqn1 = diff(x,t) - x == exp(-t)

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

eqns = [eqn1, eqn2]

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

A = solve(eqns, cond)

x_sol(t) = A.x

y_sol(t) = A.y

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')

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')

2) write a simple program to convert

$$F(s) = 2e^{-s} \sin(s) \cos(2s)$$

$$\text{and } f(t) = \frac{\pi}{(s^2 + 1)^2}$$

command window

clear

clc

syms t s F(s) f(t)

$$z = s^2 \exp(-s) \cos(2s) \cos(s) \cos(2s)$$

laplace(z)

command window

clear

clc

syms s F(s)

$$u = (3 \cdot \text{lins}) \left((s^2) + 15 \right) \cdot \text{lins} + 2 \cdot \text{lins}$$

laplace(u)