

4a) Command window

close all

clear

clc.

syms n, t.

$$\text{ode} = \text{diff}(n, t, 2) - \text{diff}(n, t) = 144t^3 + 128$$

$$Dn = \text{diff}(n, t)$$

$$y_{\text{sol}} = \text{dsolve}(\text{ode})$$

$$\text{cond1} = (n == 5)$$

$$\text{cond2} = (n == -0.5)$$

$$\text{cond} = (\text{cond1}; \text{cond2}).$$

$$y_{\text{sol}} = \text{dsolve}(\text{ode}, \text{cond}).$$

$$t = 0:0.1:1.5$$

$$tn = \text{subs}(y_{\text{sol}}, t).$$

plot(tn, t).

4b) Command window

clear all

clear

clc

Syms y x t

Ode 1 = diff(y,t) - 2\*x = exp(-2\*t);

Ode 2 = diff(x,t) + y = exp(-t);

ODES = (ode1; ode2);

YSOL = dsolve(ODES);

Cond1 = (x == 0)

Cond2 = (y == 0)

Cond = (Cond1, Cond2)

YSOL = dsolve(ODES, Cond1);

i) (x\_sol\_t, y\_sol\_t) = dsolve(ODE Cond)

ii) x\_sol\_t = SOL x

y\_sol\_t = SOL y

plot(x\_sol\_t)

hold on

plot(y\_sol\_t)

axis on

grid on

grid major

4c) Command window

clear

syms t, w, k, a.

$$p = k * \exp(-a * t) * \sin(s * w * t) * \cos(s * w * t)$$

$$g = \text{laplace}(f)$$

ii) Command window

clear

syms u s.

$$f = u(s^2) + (15 * \pi * s) + (24 * \pi^2 * s)$$

$$g = \text{iLaplace}(f)$$