

Question 4

1) Command window

close all

clear

clc.

~~ODE =~~ sym n(t), t.

~~ODE =~~ diff(n,t,2) - diff(n,t) = 144 * t^3 + 12.

~~ODE =~~ diff(n,t).

~~cond =~~

~~y_sol =~~ dsol(ODE).

~~cond1 =~~ (n == 5) ~~cond 2~~

~~cond 2 =~~ (n == -0.5).

~~cond =~~ (cond1 ; cond 2).

~~y_sol =~~ dsol(ODE, cond).

t = 0 : 0.1 : 1.5.

~~plot~~ (y_sol, t).

tn = subs(y_sol, t).

plot (tn, t).

4b.) Comment on this

clear all

clear

clc

format y z t;

$$\text{ODE1} = \text{diff}(y, t) - 2 * x = \text{exp}(-2t);$$

$$\text{ODE2} = \text{diff}(x, t) + y = \text{exp}(-t);$$

$$\text{ODES} = (\text{ODE1}, \text{ODE2});$$

$$y_{\text{sol}} = \text{dsolve}(\text{ODES});$$

$$\text{cond1} = \text{diff}(x == 0);$$

$$\text{cond2} = (y == 0);$$

$$\text{conds} = (\text{cond1}, \text{cond2});$$

$$y_{\text{sol}} = \text{dsolve}(\text{ODES}, \text{conds});$$

$$(x_{\text{sol}}(t), y_{\text{sol}}(t)) = \text{dsolve}(\text{ODES}, \text{conds});$$

$$x_{\text{sol}}(t) = \text{dsolve}(x_{\text{sol}}(t));$$

$$y_{\text{sol}}(t) = y_{\text{sol}}(t);$$

fplot(x_sol, t)

hold on

fplot(y_sol, t)

axis on

grid on