

Algo 881: TEST

QUESTION 4:

(4a)

Command window

clc  
clear  
close all

Syms n(t)

$$\text{eqn} = \text{diff}(n, t, 2) - \text{diff}(n, t) - 12 * n = 1.44 + (t^3) + 12.5;$$

$$\text{cond} = n(0) == 5, \text{diff}(n, t, 2) == -0.5;$$

ySol = dsolve (eqn, cond)

t = 0:0.1:1.5

yem = subs(ySol)

plot (yem)

grid on

Legend ('Yemi', 'location', 'best')

(4b)

Command window

clc  
clear  
close window

Syms n(t) y(t)

$$\text{eqn1} = \text{diff}(y, t) - x * x == \exp(-2 * t);$$

$$\text{eqn2} = \text{diff}(x, t) + y == \exp(-t);$$

$$\text{eqn5} = [\text{eqn1}; \text{eqn2}];$$

$$\text{cond} = x(0) == 0, y(0) == 0;$$

Ans = dsolve (eqn5, cond)

2001(E) = Ans + x  
 ySol(E) = Ans + y

ii) Visualizing the solution on graph separately continue with

plot (xSol)  
 plot (ySol)  
 grid on  
 legend ('xSol', 'location', 'host')  
 legend ('ySol', 'location', 'host')

iii) Visualizing the solution on graph together continue

plot (xSol)  
 hold on  
 plot (ySol)  
 grid on  
 legend (xSol, 'ySol', 'location', 'host')

47c

Command window

cle

clear

classall

Syms t s u v x c K a

x = K \* exp(-q \* t) \* sin(c \* w \* t) + cos(3 \* w \* t)

f = laplace(x, t, s)

syms(p)

part(f, s)

Syms t s

f = pi \* / ((s^2 + 15 \* pi + 5 + 24 \* (pi^2 \* 3)))

Laplace(f)

Simplify(ans)

pretty(ans)