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Pennsylvania Engineering

19/Engineering

C

Answer

(Aa) Command window

clc

clear all

close all

Syms n(t)

Cond1 = n(0) == 5

~~Cond2 =~~

D(n) = diff(n,t)

Cond2 = D(n) == -0.5

Ode = diff(n,t,2) - diff(n,t) - 12*n == 144*(t^3) + 12.5

Conds = [Cond1 Cond2]

nSol(t) = dsolve(Ode, Conds)

t = 0:0.1:1.5

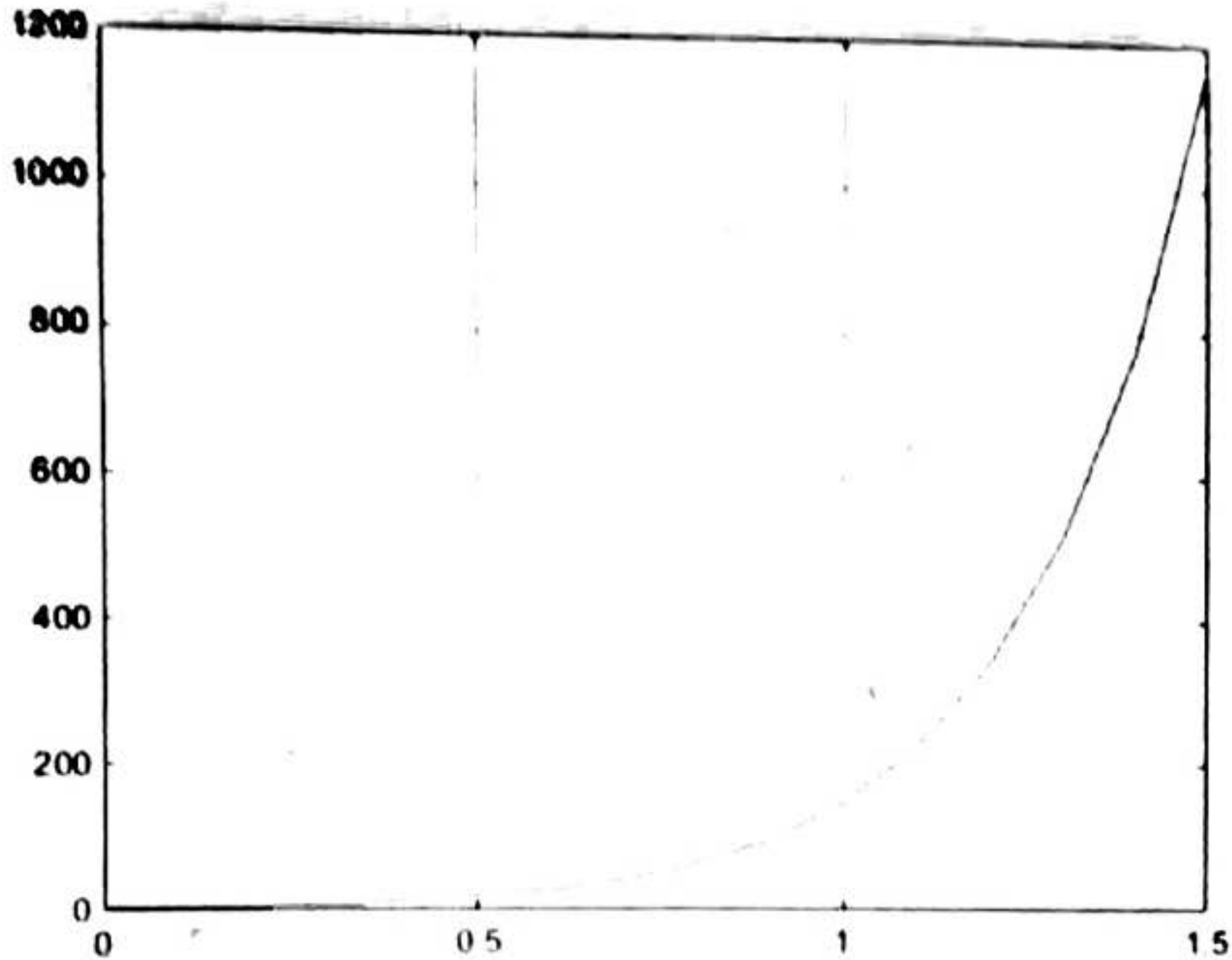
Gab = subs(nSol(t))

plot(Gab)

grid on

axis tight

legend('Gab', 'location')



4b) Command window

clc

clear all

close all

Syms x(t) y(t)

D(x) = diff(x, t)

D(y) = diff(y, t)

Ode1 = [D(y) - 2*x == exp(-2*t)]

Ode2 = [D(x) + y == exp(-1)]

Odes = [Ode1; Ode2]

Gab = dsolve(Odes)

Ysol(t) = Gab.y

Xsol(t) = Gab.x

Visualizing the solution graphically

plot(Ysol)

plot(Xsol)

int on

legend('Xsol' 'location' 'best')

legend('Ysol' 'location' 'best')

Visualizing the solution together

Plot (x, y)

hold on

Plot (y, x)

grid on

legend('x, y', 'x', 'y', 'b', 'r')

HC) Command window

clc

clear all

close all

syms t, s, w, a, q

$$y = a * \exp(-a * t) * \sin(5 * w * t) * \cos(3 * w * t)$$

F = laplace(y)

simplify(F)

ii) Command window

clc

clear all

close all

syms t, s, E

$$G = E * / (s^2 + (15 * P_1 * s) + 24 * (P_1 * 3))$$

F = laplace(G)

simplify(F)