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Civil Engineering

17/ENG03102

ENG 391 Engineering maths TD

4a) command window

clear

clc

clear all

Syms n(t)

D = diff(n)

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

cond1 = D(0) == -0.5;

cond2 = n(0) == 5;

conds = [cond1 cond2];

dsol(t) = dsolve(ode, conds);

dsol = simplify(dsol(t))

tn = [0:0.1:1.5]

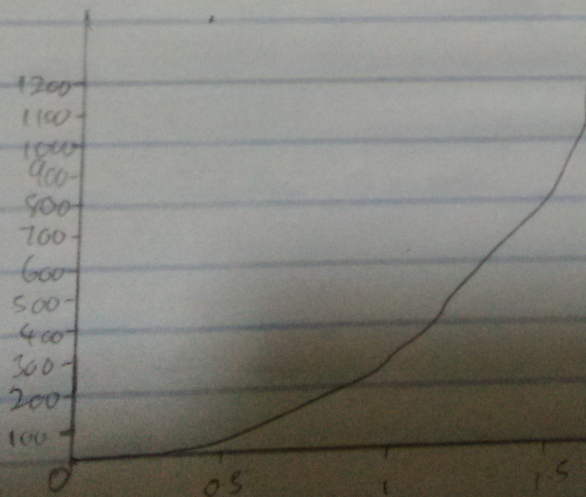
Ans = subs(dsol, tn)

plot(tn, Ans)

grid on

grid minor

axis tight

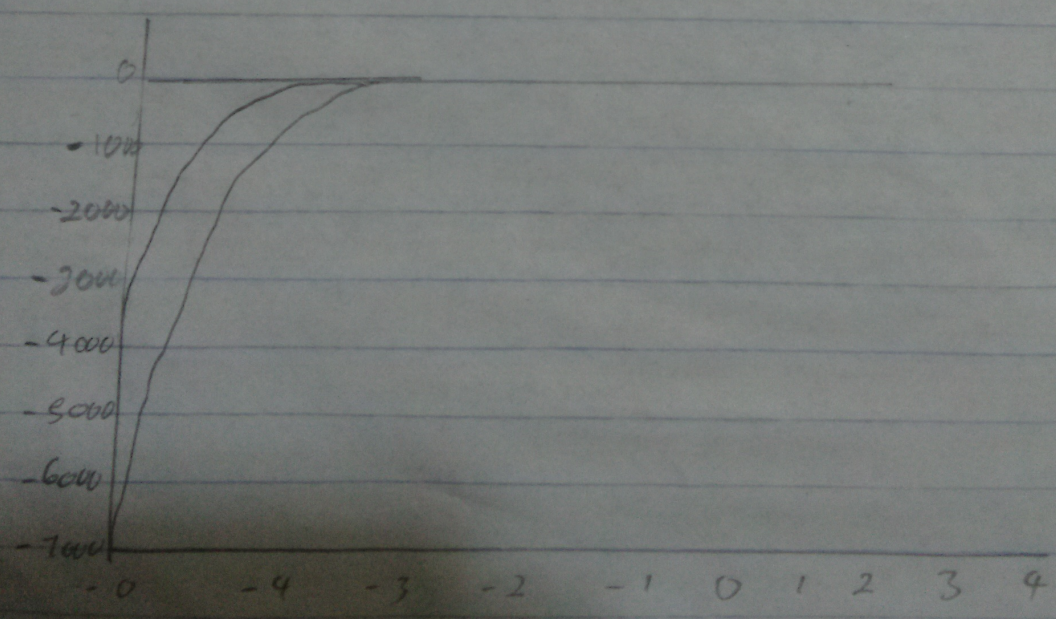


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(4b) Command window

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clear  
clc  
close all  
syms y(t) x(t)  
ode1 = diff(y,t) - 2*x == exp(-2*t)  
ode2 = diff(x,t) + y == exp(-t)  
odeA = [ode1, ode2]  
cond = [y(0) == 0, x(0) == 0]  
[yeg xeg] = dsolve(odeA, cond)  
fplot(yeg)  
hold on  
fplot(xeg)  
legend('yeg', 'xeg', 'Location', 'best')  
grid on  
grid minor  
axis tight
```



4c) ① command window

clear

clc

Syms k w f(t) a

$$Z = k \exp(-a * t) * \sin(s * \omega * t) * \cos(3 * \omega * t)$$

laplace(z)

② Command window

clear

clc

Syms f(s)

$$u = (3.142) / (s^2 + 15 * 3.142 * s + 24 * (3.142^2 * 3))$$

ilaplace(u)