

OGBONNA WISDOM OKORO

17/ENG03/037
CIVIL ENGINEERING

4.8 Command window

```
clc
```

```
close all
```

```
syms n(t)
```

```
D = diff(n)
```

```
ode = (diff(6, 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);
```

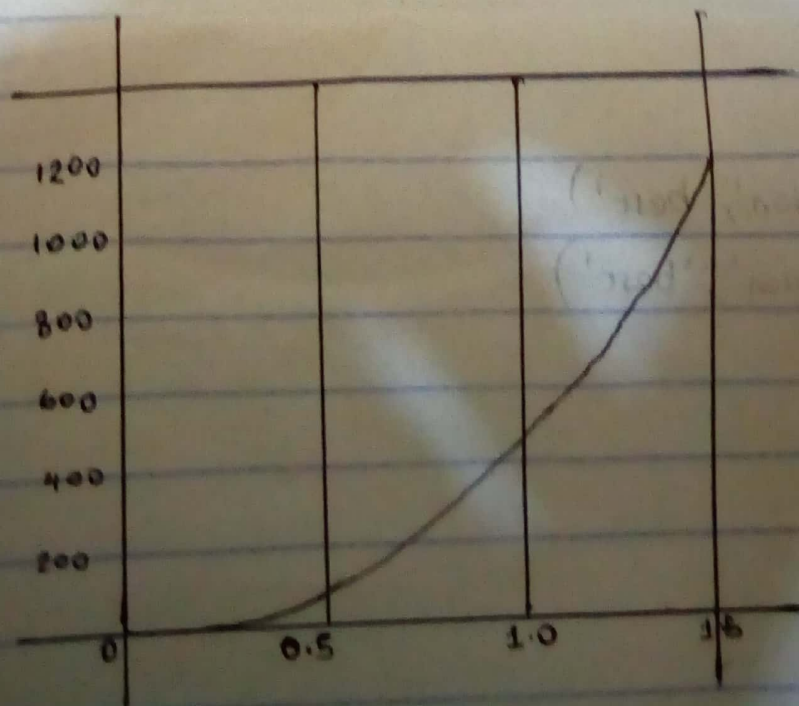
```
dsol = simplify(dsol(t));
```

```
t_n = [0:0.1:1.5]
```

```
hndstram = subs(dsol, t_n)
```

```
plot(t_n, hndstram)
```

```
grid on
```



4b

Command Window

clear

clc

syms y(t) y x(t)

Dy = diff(y, t)

Dx = diff(x, t)

eqn1 = Dy == exp(-2*t) + 2*x

eqn2 = Dx == exp(-1*t) - y

ode = [eqn1; eqn2]

cond = x(0) == 0, y(0) == 0;
smpson = dsolve(ode, cond)

ysol(t) = smpson.y

xsol(t) = smpson.x

i* fplot(ysol)

hold on

fplot(xsol)

grid on

ii* fplot(xsol)

fplot(ysol)

grid on

legend('xsol', 'Location', 'best')

legend('ysol', 'Location', 'best')

4c

$$F(s) = \frac{\pi}{(s^2 + 15\pi s + 24\pi^3)}$$

commandwindow

clear

clc

syms f(s) a

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

ilaplace(u)

$$f(t) = Ke^{-at} \sin(5\omega t) \cos(3\omega t)$$

command window

clear

clc

syms f(t) k w t a

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

laplace(z)