MATLAB R2018a

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```
commandwindow
clear
clc
close all
syms y(t) a
x = [0,0.5:7.5]
shhham = diff (y,t) == 51-0.025*y
shhham2 = diff (y,t) == -0.025*y +51
s = dsolve (shhham)
s = dsolve (shhham2)
```

Current Folder

Workspace

Name	Value
a	1x1 sym
s	1x1 sym
shhham	1x1 symfun
shhham2	1x1 symfun
t	1x1 sym
x	[0,0.5000,1.5000,2.500...
y	1x1 symfun

Command Window

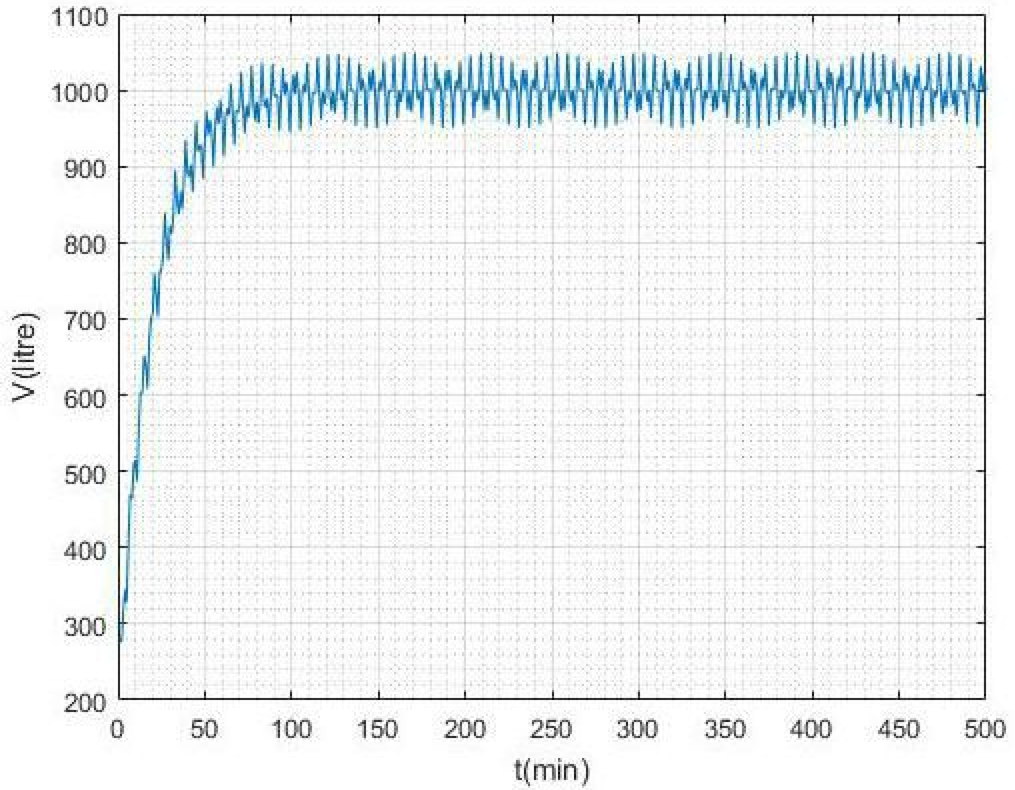
```
x =

         0    0.5000    1.5000    2.5000    3.5000    4.5000    5.5000    6.5000    7.5000


shhham(t) =

diff(y(t), t) == 51 - y(t)/40


shhham2(t) =

diff(y(t), t) == 51 - y(t)/40


s =

C1*exp(-t/40) + 2040


s =

C1*exp(-t/40) + 2040

>>
```

script Ln 10 Col 21

```
commandwindow
clear
clc
close all
syms t
y = (50/0.05)+((50/1.0025)*sin(t))+(((50*(0.05))/1.0025)*cos(t)
ym = 1000-(800*exp(-0.05*t))
oddValues = 1:2:500
evenValues = 2:2:500
ym = double(subs(y, oddValues))
ymm = double (subs(ym, evenValues))
totTime = 1:1:500
timeTrans = totTime'
c = reshape([ym,ymm],[],1)
combVal = double(c)
plot(totTime, c)
grid on
grid minor
xlabel('T(min)'), ylabel('V(litre)')
col_header = {'t(min)', 'V(Litre)'}
xlswrite['odevbesdata.xlsx',col_header,'veriler','A2')
xlswrite['odevbesdata.xlsx',timeT,'veriler','A3')
xlswrite['odevbesdata.xlsx',combined,'veriler','B2')
```

Workspace

Name	Value
c	62750x1 double
combVal	62750x1 double



1100
1000
900
800
700
600
500
400
300
200
V(litre)
0
50
100
150
200
250
300
350
400
450
500
t(min)

Date. No.

Giles Onoluabi 18/ENG04/065
Elect/Elect

1) If accumulation rate = input rate of salt - output rate of salt, the differential equation should be:

$$dy/dx = y_{in} - y_{out}$$

50 gal of brine enters the tank each minute. One gallon contains (1+sin t) lb of salt at t = 1.

~~(1+ salt~~

$(1+\sin t) = (1+\sin(1)) = 1.02$ lb/gal $=$ 51 lb/min

30 gal = 2.5% of the tank's content, and 1200 gal being considered, 2.5% of the salt is present in the tank will also leave per minute ∴ $y_{out} = 2.5\%\ y$

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- $\frac{dy}{dt}$ $\frac{lb}{min}$ = 51 $\frac{lb}{min}$ — 2.5% of y $^{lb/min}$

- $\frac{dy}{dt} = 51 - 0.025y$; $\frac{dy}{dt} = -0.025y +$
51

$\frac{dy}{dt} = -0.025\left[\frac{-0.025y + 51}{-0.025y - 0.025}\right]$; $\frac{dy}{dt}$
$= -0.025$
$(y - 2040)$;
$\frac{dy}{(y-2040)} = -0.025\,dt$; $\int \frac{dy}{(y-2040)} = \int -0.025\,dt$

$\int \frac{dy}{(y-2040)} = -0.025 \int dt$; $\ln(y - 2040) = -0.025t + c$

$y - 2040 = e^{-0.025t + c}$; $y - 2040 = e^{-0.025t + c}$ e^{c}
$y - 2040 = e^{-0.025} y_0$; $y - 2040 = y_0 e^{-0.025t}$;
$y = y_0 e^{-0.025} + 2040$; if t is = 0min initially
$y = 150\,lb$
$150 = y_0 e^{-0.025(0)} + 2040$; $150 - 2040 = y_0 \times 1$;
$y = -1890$

Date. No.

$y_1 = -1890e^{-0.025t} + 2040$

$y_2 = \sout{2040 - 1890 e^{-0}}$

$2040 - 1890 e^{-0.025t}$