ALANZA IJEOMA SHALOM
18/SCT01/016
COMPUTER ENGINEERING
ENG 282

$\frac{dy}{dt} = ky$

$\frac{dy}{y} = kdt$

$\int \frac{dy}{y} = \int kdt$

$\ln y = kt + c$

$y = e^{kt+c}$

$y = e^{kt} \times e^{c}$

$y = e^{kt} \times y_0$

$\therefore y = y_0 e^{kt}$ for case A

The initial number of bacteria at $t = 0$ is 50

$50 = y_0 e^{k(0)}$

$50 = y_0 \cdot 1$

$\therefore y_0 = 50$

The number of bacteria at $t = 9$hrs is $50 \times 3 = y$
$y = 150$

$\therefore y = 50e^{k(9)}$

$150 = 50e^{9k}$

$e^{9k} = 150/50 \Rightarrow e^{9k} = 3$

$9k = \ln 3$

$9k = 1.0986$

$k = \frac{1.0986}{9}$

$k = 0.122$

$y = 50e^{0.122(t)}$

For case B

$g = g_0 e^{kt}$

The initial number at $t=0$ is 150

$\therefore 150 = g_0 e^{k(0)}$

$150 = g_0 \cdot 1$

$\therefore g_0 = 150$

The number of bacteria at $t = 9$hrs is $150 \times 3 = 450$

$\therefore 450 = 150 e^{k(9)}$

$e^{9k} = \frac{450}{150}$

$e^{9k} = 3$

$9k = \ln 3$

$9k = 1.0986$

$k = \frac{1.0986}{9}$

$k = 0.122$

$\therefore g = 150 e^{0.122(t)}$

$\therefore$ For case B

$g(t) = 150 e^{0.122(t)}$

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commandwindow

clearvars

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FOR CASE A

$t := (0..15)$

$y(t) := 50 \cdot e^{0.122(t)}$

t =	y(t) =
0	50
1	56.488
2	63.817
3	72.098
4	81.453
5	92.022
6	103.962
7	117.451
8	132.691
9	149.908
10	169.359
11	191.334
12	216.161
13	244.209
14	275.896
15	311.694

FOR CASE B

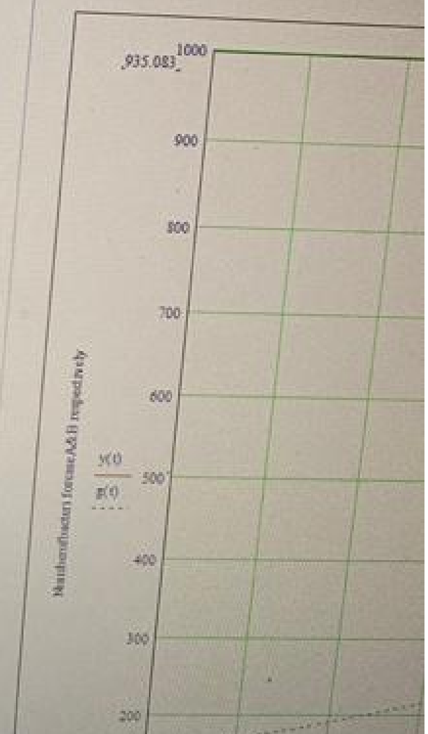
$g(t) := 150 \cdot e^{0.122(t)}$

t =	g(t) =
0	150
1	169.463
2	191.452
3	216.293
4	244.358
5	276.065
6	311.885
7	352.354
8	398.073
9	449.725
10	508.078
11	574.003
12	648.483
13	732.626
14	827.687
15	935.083

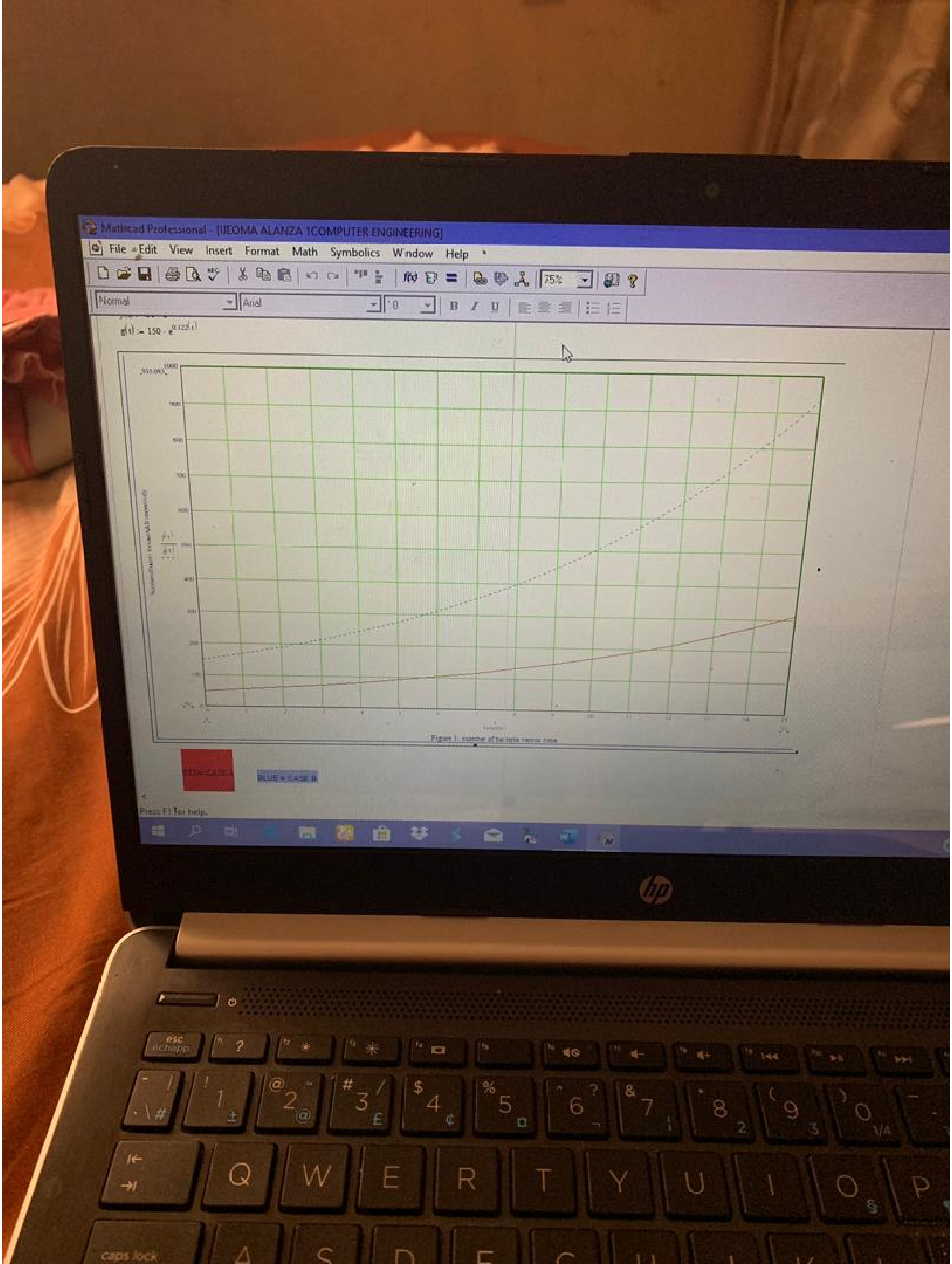
$t := (0..15)$

$y(t) := 50 \cdot e^{0.122(t)}$

$g(t) := 150 \cdot e^{0.122(t)}$



Press F1 for help.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75%
Normal
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BLUE = CASE B
Press F1 for help.
hp
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Q W E R T Y U I O P