$t := 0, 1 .. 15$

$A(t) := 50 \cdot \exp(0.122 \cdot t)$

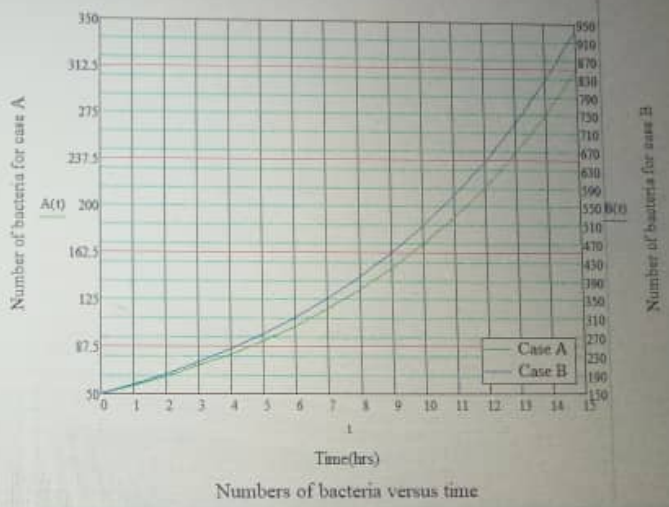
$A(t) =$

50
56.488
63.817
72.098
81.453
92.022
103.962
117.451
132.691
149.908
169.359
191.334
216.161
244.209
275.896
311.694

$B(t) := 150 \cdot \exp(0.122 \cdot t)$

$B(t) =$

150
169.463
191.452
216.293
244.358
276.065
311.885
352.354
398.073
449.725
508.078
574.003
648.483
732.626
827.687
935.083



Numbers of bacteria versus time

Press F1 for help

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18/ENG06/021
ENG 282

$y = y_0 e^{kt}$

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

$\frac{y}{y_0} = e^{kt} = 3$ at $t = 9$.

$\frac{y}{y_0} = e^{kt} = 9$ at $t = 18$.

$\therefore y_0 = 50$ — i

$y_0 = 150$ — ii

$\therefore y = 50 e^{kt}$ — iii

$y = 150 e^{kt}$ — iv

$\therefore 3 = e^{kt}$

$\ln 3 = \ln e^{k(9)}$

$\ln 3 = k9$.

$k = \frac{\ln 3}{9}$

$k = 0.122$

$9 = e^{kt}$

$\ln 9 = \ln e^{k(18)}$

$\ln 9 = k(18)$

$k = \frac{\ln 9}{18}$

$k = 0.122$

$\therefore y = 50e^{0.122t}$ — v

$y = 150e^{0.122t}$ — vi