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18/EN904/069

ELIC ELed

ASSIGNMENT

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

$$\frac{dy}{y} = k dt$$

$$\int \frac{dy}{y} = \int k dt$$

$$\ln y = kt + c$$

$$y = e^{kt+c}$$

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

$$y_0 = e^c$$

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

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

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

$$50 = y_0 \cdot 1$$

$$\therefore y_0 = 50$$

$$\therefore y = 50e^{kt}$$

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

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

$$150 = 50 e^{9k}$$

$$e^{9k} = \frac{150}{50}$$

$$e^{9k} = 3$$

$$9k = \ln 3$$

$$9k = 1.0986$$

$$k = \frac{1.0986}{9} = 0.122$$

$$y = 50 e^{0.122(9)}$$

$$y_t = 50 e^{0.122(9)}$$

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t = 0..15

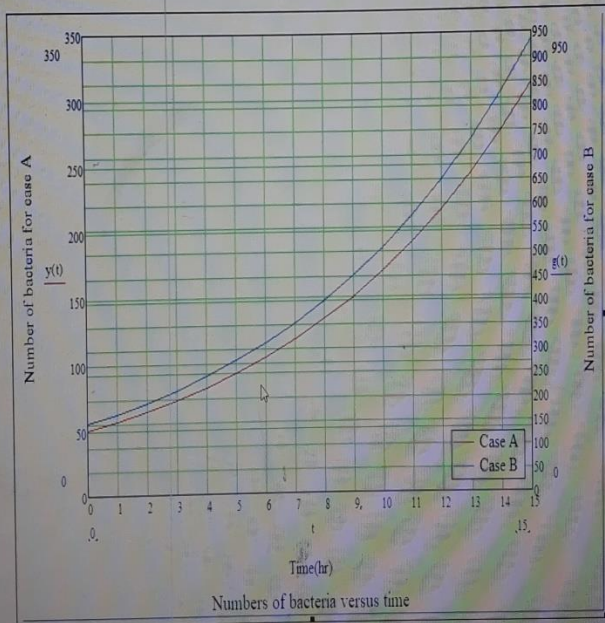
$$y(t) = 50 \cdot e^{0.122(t)}$$

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

t =
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

y(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

g(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



Calculator

sin cos tan ln log
 nl i |x| r r
 e^x $\frac{1}{x}$ $()$ x^2 x^y
 π 7 8 9 /
 $\frac{1}{x}$ 4 5 6 \times
 \div 1 2 3 +
 \pm 0 - =

Evaluate

= π =
 \rightarrow \rightarrow f x
 x f x y z y

Matrix

$\begin{bmatrix} \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \end{bmatrix}$ \times x^y $|x|$
 \rightarrow n^p n^t $a..b$
 $\bar{\cdot}$ $\bar{\cdot}$ $\bar{\cdot}$ $\bar{\cdot}$

Graph

\rightarrow \rightarrow \rightarrow \rightarrow
 \rightarrow \rightarrow \rightarrow \rightarrow
 \rightarrow \rightarrow \rightarrow \rightarrow