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Elect / Elect Engineering
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Y_0 = initial substance

y = final

$$\text{Formula} = y - y_0 e^{-kt}$$

$$y/y_0 = e^{kt} = 3 \quad t = 9$$
$$\therefore y = 3 \times y_0$$

$$y/y_0 = e^{kt} = 9 \quad t = 18$$

$$y_0 = 50 \quad (i) \quad y = 50 e^{kt}$$

$$y_0 = 150 \quad (ii) \quad y = 150 e^{kt}$$

[constant $\times t$]
 \downarrow

e^{kt} = exponential

$$e^{kt} = 3$$

$$\ln 3 = kt$$

$$\ln 3 = 9k$$

$$k = \ln 3 / 9 = 0.1221$$

$$e^{kt} = 9$$

$$\ln 9 = 18k$$

$$k = \frac{\ln 9}{18} = 0.122$$

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

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

Graph is on the next page

$$t = 0, 1, 15$$

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

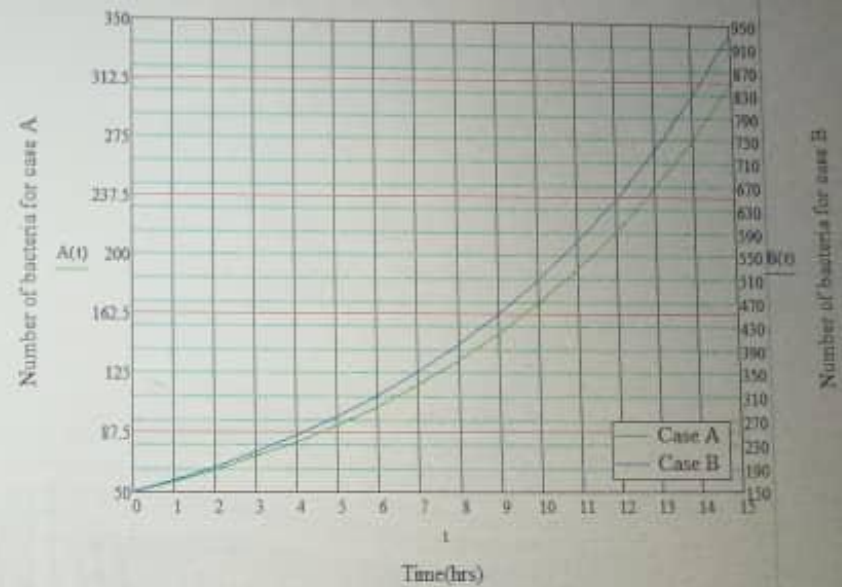
$$B(t) = 150 \exp(0.122 t)$$

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
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