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ENG 282

Computer Engineering

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

$$y = 2y_0$$

$$\therefore y_0 = \frac{y}{2}$$

$$A \quad \frac{y}{y_0} = e^{kt} = 3, \text{ at } t=9$$

$$B \quad \frac{y}{y_0} = e^{kt} = 9, \text{ at } t=18$$

$$A, y_0 = 50 \text{ --- (I)}$$

$$B, y_0 = 150 \text{ --- (II)}$$

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

$$y = 150e^{kt} \text{ --- (III)}$$

$$y = 150e^{kt} \text{ --- (IV)}$$

$$\Rightarrow 3 = e^{kt}$$

$$\ln 3 = kt$$

$$\ln 3 = 9k,$$

$$k = \frac{\ln 3}{9} = 0.12$$

$$\Rightarrow 9 = e^{kt}$$

$$\ln 9 = kt$$

$$\ln 9 = 18k$$

$$k = \frac{\ln 9}{18} = 0.12$$

$$\therefore A \text{ --- } y = 50e^{0.12t}$$

$$B \text{ --- } y = 150e^{0.12t}$$

$$A \text{ --- } y = 50e^{0.12t}$$

$$B \text{ --- } y = 150e^{0.12t}$$

$$k = 0.1, 15$$

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

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

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

B(t) =

150
169.461
191.452
216.293
244.358
276.065
311.885
352.354
398.073
449.725
508.078
574.003
648.483
732.626
827.667
935.083

Number of bacteria for case A



Numbers of bacteria versus time

Number of bacteria for case B