

Abramah Johnpaul

16/ENG-04/034

Electrical/Electronics Eng

ENG 282

Engineering maths II

Solution

$$y = ky$$

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

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

$$\ln y = kt + c$$

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

$$y = ce^{kt} = e^{kt} \cdot e^c$$

$$y = ce^{kt}$$

$$c = y_0$$

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

$$y = 2y_0$$

when $t = 5$

$$2y = y_0 e^{k(5)}$$

$$2 = e^{5k}$$

$$5k = \ln 2$$

$$k = \frac{\ln 2}{5}$$

$$k = 0.1386$$

$$y = 20e^{0.1386t}$$

for $1\frac{1}{2}$ days = (36 hours)

$$y = 20e^{0.1386 \times 36}$$

$$y = 2937.55 \text{ bacteria}$$



