



AGBOOLA PRAISE OLUWALEKE  
OLINGGOSIOS  
MECHATRONICS

ASSIGNMENT

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

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

$$\ln y = kt + c$$

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

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

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

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

$$y = 2y_0$$

when  $t = 5$

$$2y_0 = y_0 e^{5k}$$

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

$$5k = \ln 2$$

$$k = \frac{\ln 2}{5} = 0.1386$$

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

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

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

$$\therefore y = 2437.55 \text{ bacteria}$$