Onolabi Tomisin
16/ENG01/017
Elect/Elect
Cy; {ENG282}

$2y_0 = y$

When $t = 5$

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

$\frac{dy}{y} = K\,dt$

$\int \frac{1}{y}\,dy = K\int dt$

$\ln y = tK + C$

$e^{\ln y} = e^{tK} \cdot e^{c}$ (where $e^{c} = y_0$)

$y = y_0 e^{tK}$

If $y_0 = 20$ and $t = 5$

$2y_0 = y_0 e^{tK}$

$2 \times 20 = 20e^{5K}$

$40 = 20e^{K5}$

$\frac{40}{20} = e^{K5}$

$2 = e^{5K}$

$\ln 2 = \ln e^{5K}$

$\ln 2 = 5K$

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

$K = \frac{0.69315}{5}$

$K = 0.1386$

$y = y_0 e^{0.1386t}$

$\{y = 20e^{0.1386t}\}$ Ans General Solution for Model

Scanned by CamScanner

ii) (Population of Bacteria = 1½ days)

(1 day + ½ = 36 hours)

$y = y_0 e^{0.1386t}$

$y = y_0 e^{0.1386 \times 36}$

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

$y = 20 e^{4.99}$

$y = 20 \times 146.99$

$y = 2938.8$