

Ovi Emmanuel Chendrashekhara

16/Eng 06.10.60

Mechanical

ENG 282

Answer

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

$$\int \frac{1}{y} dy = \int k dt$$

$$\ln y = kt + C$$

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

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

$$\text{Let } e^C = y_0$$

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

But $y = dy_0$ and $t = 5 \text{ hrs}$

$$dy_0 = y_0 \cdot e^{5k}$$

$$\ln d = 5k$$

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

$$= 0.139$$

$$y = y_0 e^{0.139t}$$

b) 24 hours = 1 day

$$2C = 1 \frac{1}{2} \text{ day}$$

$$2C = 24 \times 1.5 = 36 \text{ hrs}$$

Where $y_0 = 20$, and $t = 36$

$$y = 20 e^{0.139 \times 36}$$

$$y = 2980.2$$