

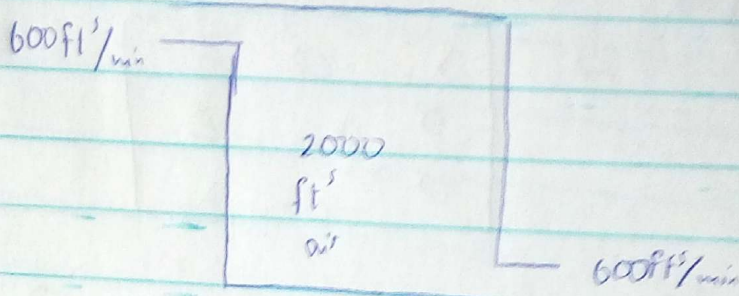
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16/ENG05/022

Mechanics Engineering

ENG 282

Assignment



$$\frac{dy}{dt} = y_{in} - y_{out}$$
$$y_{in} = 600$$

$$y_{out} = \frac{600}{2000} = 0.03y$$

$$\frac{dy}{dt} = 600 - 0.03y$$

$$\frac{dy}{dt} = -0.03(y - 2000)$$

$$\int \frac{dy}{(y - 2000)} = \int -0.03 dt$$

$$\ln(y - 2000) = -0.03t + c$$

$$y - 2000 = e^{-0.03t + c}$$

$$y - 2000 = y_0 e^{-0.03t}$$

$$y = y_0 e^{-0.03t} + 2000$$

(a) At $t=0$; $y=0$

$$y = y_0 e^{-0.03t} + 2000$$

$$0 = y_0 e^{-0.03(0)} + 2000$$

$$\therefore y_0 = -2000$$

$$W_0 = 2000 - 18000$$

$$y = 18000$$

$$y = -2000 e^{-0.03t} + 2000 \dots \text{model}$$