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

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

$$\frac{dy}{dt} = -0.03(y - 20000)$$

$90\% \times 20000 = 18000$

$y = 18000$

$18000 = -20000e^{-0.03t} + 20000$

$18000 - 20000 = -20000e^{-0.03t}$

$0.1 = e^{-0.03t}$

$\ln(0.1) = -0.03t$

$t = 76.8 \text{ mn}$

$y_{in} = 600$

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

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

$\frac{dy}{dt} = -0.03(y - 20000)$

$\int \frac{dy}{} = \int -0.03 dt$