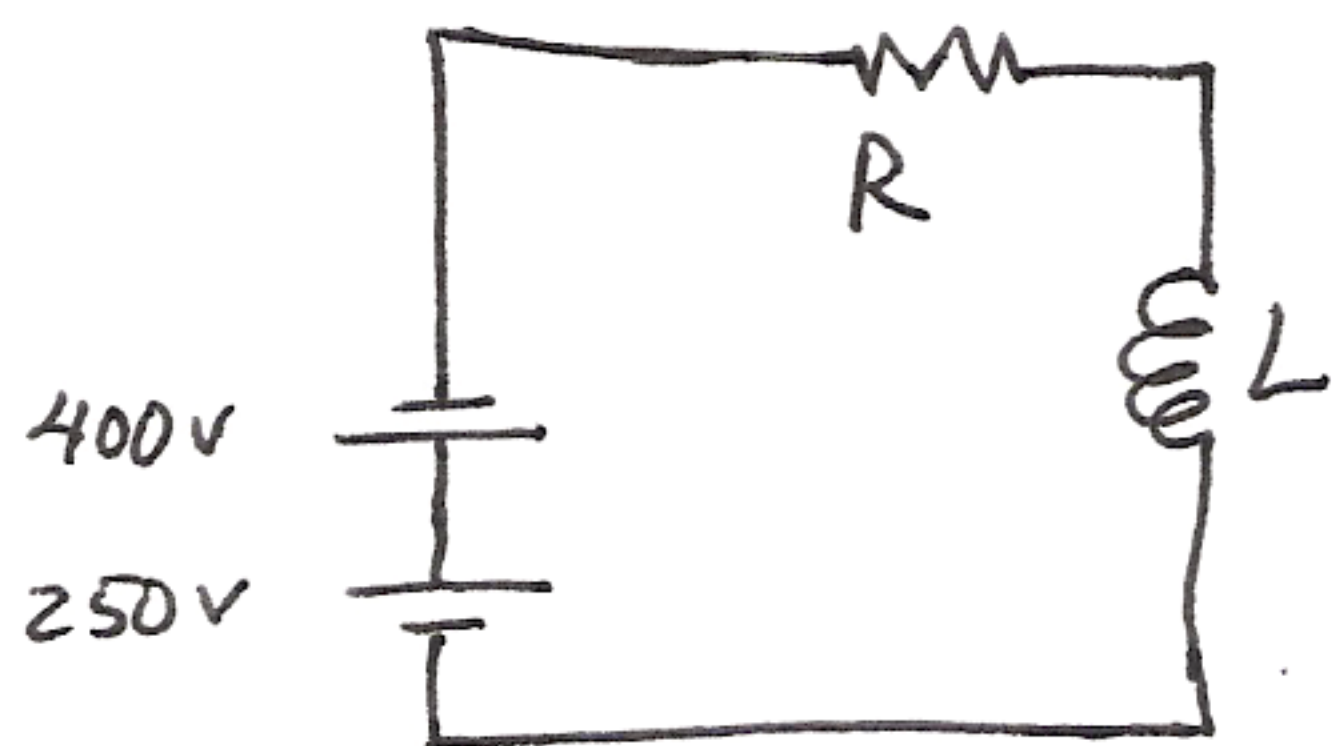


Prob. 2.9



$$\tau = \frac{L}{R} = 0.5s, \quad R = 0.8\Omega, \quad L = 0.4H$$

$$@ t = 0^- \quad I(0) = \frac{250}{0.8} = 312.5A$$

$$RI + L \frac{dI}{dt} = -150$$

$$I' + \frac{R}{L} I = -\frac{150}{L}$$

$$s \dot{I}(s) - I(0) + \frac{R}{L} \dot{I}(s) = -\frac{150}{sL} \quad ; \quad \tau = \frac{L}{R}$$

$$\left(s + \frac{1}{\tau}\right) \dot{I}(s) = I(0) - \frac{150}{sL}$$

$$\dot{I}(s) = \frac{I(0)}{s + \frac{1}{\tau}} - \frac{150}{L} \cdot \frac{1}{s(s + \frac{1}{\tau})}$$

$$I(t) = I(0)e^{-\frac{t}{\tau}} - \frac{150}{L} \cdot \tau (1 - e^{-\frac{t}{\tau}})$$

substituting values; $I(t) = 312.5e^{-t/\tau} - 187.5(1 - e^{-t/\tau})$
 $= (312.5 + 187.5)e^{-2t} - 187.5$

OR $I(t) = 500e^{-2t} - 187.5$

t	I(t)
0	312.5
.5	-3.56
1.0	-119.83
1.5	-162.61
2.0	-178.84
2.5	-184.13
3.0	-186.3
3.5	-187.04

