

91. Using Eq. 31-43, we find

$$i = \frac{\mathcal{E}}{R} \left(1 - e^{-t/\tau_L} \right) \implies \tau_L = \frac{t}{\ln \left(\frac{1}{1 - \frac{iR}{\mathcal{E}}} \right)} = 22.4 \text{ s} .$$

Thus, from Eq. 31-44 (the definition of the time constant), we obtain $L = (22.4 \text{ s})(2.0 \Omega) = 45 \text{ H}$.