

Problem 20.44

If the time constants are the same for the RL and RC circuit, what must R be?

$$\tau_L = L/R = \tau_C = RC$$

$$\Rightarrow L/R = RC$$

$$\Rightarrow L/C = R^2$$

$$\Rightarrow R = \sqrt{\frac{L}{C}}$$

$$\Rightarrow R = \sqrt{\frac{(3 \text{ H})}{(3 \times 10^{-6} \text{ F})}}$$

$$\Rightarrow R = 10^3 \Omega$$

