

Chapter 7, Solution 87.

Let i be the inductor current.

$$\text{For } t < 0, \quad i(0^-) = \frac{120}{100} = 1.2 \text{ A}$$

For $t > 0$, we have an RL circuit

$$\tau = \frac{L}{R} = \frac{50}{100 + 400} = 0.1, \quad i(\infty) = 0$$

$$i(t) = i(\infty) + [i(0) - i(\infty)] e^{-t/\tau}$$

$$i(t) = 1.2 e^{-10t}$$

At $t = 100 \text{ ms} = 0.1 \text{ s}$,

$$i(0.1) = 1.2 e^{-1} = \mathbf{441 \text{ mA}}$$

which is the same as the current through the resistor.