33.21. **Visualize:** Please refer to Figure Ex33.21. This is a simple *LR* circuit if the resistors in parallel are treated as an equivalent resistor in series with the inductor.

Solve: We can find the equivalent resistance from the time constant since we know the inductance. We have

$$\tau = \frac{L}{R_{\text{eq}}} \Rightarrow R_{\text{eq}} = \frac{L}{\tau} = \frac{3.6\times10^{-3}\ \text{H}}{10\times10^{-6}\ \text{s}} = 360\ \ \Omega$$

The equivalent resistance is the parallel addition of the unknown resistor R and 600 Ω. We have

$$\frac{1}{R_{\text{eq}}} = \frac{1}{600\ \Omega} + \frac{1}{R} \Rightarrow R = \frac{(600\ \ \Omega)(360\ \ \Omega)}{600\ \ \Omega - 360\ \ \Omega} = 900\ \ \Omega$$