Chapter 6, Solution 34.

The current through a 10-mH inductor is $10e^{-t/2}$ A. Find the voltage and the power at $t = 3$ s.

Solution

$i = 10e^{-t/2}$

$$v = L\frac{di}{dt} = 10x10^{-3}(10)\left(\frac{1}{2}\right)e^{-t/2}$$

$= -50e^{-t/2}$ mV

$v(3) = -50e^{-3/2}$ mV = **–11.157 mV**

$p = vi = -500e^{-t}$ mW

$p(3) = -500e^{-3}$ mW = **–24.89 mW**.