

Chapter 6, Solution 37.

$$\begin{aligned}v &= L \frac{di}{dt} = 12 \times 10^{-3} \times 4(100) \cos 100t \\&= \mathbf{4.8 \cos (100t) \text{ V}}\end{aligned}$$

$$p = v i = 4.8 \times 4 \sin 100t \cos 100t = 9.6 \sin 200t$$

$$\begin{aligned}w &= \int_0^t p dt = \int_0^{1/200} 9.6 \sin 200t \\&= -\frac{9.6}{200} \cos 200t \Big|_0^{1/200} \text{ J} \\&= -48(\cos \pi - 1) \text{ mJ} = \mathbf{96 \text{ mJ}}\end{aligned}$$

Please note that this problem could have also been done by using $(\frac{1}{2})Li^2$.