**Chapter 6, Solution 84.**

An 8-mH inductor is used in a fusion power experiment. If the current through the inductor is $i(t) = 5\sin^2(\pi t)$ mA, t >0, find the power being delivered to the inductor and the energy stored in it at t=0.5s.

**Solution**

$v = L(di/dt) = 8x10^{-3}x5x2\pi\sin(\pi t)\cos(\pi t)10^{-3} = 40\pi\sin(2\pi t)\ \mu V$

$p = vi = 40\pi\sin(2\pi t)5\sin^2(\pi t)10^{-9}$ W, at t=0 p = **0W**

$$w = \frac{1}{2}Li^2 = \frac{1}{2}x8x10^{-3}x[5\sin^2(\pi/2)x10^{-3}]^2 = 4x25x10^{-9} = \underline{100\ nJ}$$

= **100 nJ**