

Physics 111 Homework Solutions for Tuesday 2/3 and Wednesday 2/4

Tuesday, February 3, 2015

Chapter 18

Questions

- None

Multiple-Choice

- None

Problems

- None

Wednesday, February 4, 2015

Chapter 18

Questions

- None

Multiple-Choice

- None

Problems

18.1 The induced *emf* is given by Faraday's Law. We have therefore

$$\mathcal{E} = -N \frac{\Delta \Phi_B}{\Delta t} = -100 \frac{((0.5 \times 10^{-12} \text{ T})(\pi(0.01 \text{ m})^2) - 0)}{0.1 \text{ s}} = -1.57 \times 10^{-13} \text{ V}$$

18.2 The magnetic field at the coil is given by **Error! Objects cannot be created from editing field codes.** The induced *emf* is given by Faraday's law:

$$\mathcal{E} = -N \frac{\Delta \Phi_B}{\Delta t} = -1 \frac{((5 \times 10^{-7} \text{ T})(\pi(2.5 \times 10^{-3} \text{ m})^2) - 0)}{0.2 \text{ s}} = -4.91 \times 10^{-11} \text{ V.}$$

Since the flux is decreasing with time the induced current is *ccw* as shown in the figure below.

