Problem 20.8

Magnetic field rises from zero to 1.5 T in .12 seconds. What's the induced EMF if the coil through which the flux changes has a radius of .0016 meters?

Magnetic field rises from zero to 1.5 T in .12 seconds. What's the induced EMF if the coil through which the flux changes has a radius of .0016 meters?

$$\varepsilon_{induced} = -N\frac{\Delta\phi_B}{\Delta t}$$

$$= -N\frac{\Delta\left(B\ A\cos 0^{o}\right)}{\Delta t}$$

$$= -(1)\ (\pi r^2)\ (1)\ \frac{\Delta(B)}{\Delta t}$$

$$= -(1)\ (\pi(.0016)^2)\ (1)\ \frac{(1.5\ -\ 0)}{(.12)}$$

$$= -10^{-4}\ \text{volts}$$