

88. (a) The self-inductance per meter is

$$\frac{L}{\ell} = \mu_0 n^2 A = (4\pi \times 10^{-7} \text{ H/m}) (100 \text{ turns/cm})^2 (\pi)(1.6 \text{ cm})^2 = 0.10 \text{ H/m} .$$

(b) The induced emf per meter is

$$\frac{\mathcal{E}}{\ell} = \frac{L}{\ell} \frac{di}{dt} = (0.10 \text{ H/m})(13 \text{ A/s}) = 1.3 \text{ V/m} .$$