

84. (a) The magnitude of the average induced emf is

$$\mathcal{E}_{\text{avg}} = \left| \frac{-d\Phi_B}{dt} \right| = \left| \frac{\Delta\Phi_B}{\Delta t} \right| = \frac{BA_i}{t} = \frac{(2.0 \text{ T})(0.20 \text{ m})^2}{0.20 \text{ s}} = -0.40 \text{ V} .$$

- (b) The average induced current is

$$i_{\text{avg}} = \frac{\mathcal{E}_{\text{avg}}}{R} = \frac{0.40 \text{ V}}{20 \times 10^{-3} \Omega} = 20 \text{ A} .$$