

33. (a) The point at which we are evaluating the field is inside the solenoid, so Eq. 31-27 applies. The magnitude of the induced electric field is

$$E = \frac{1}{2} \frac{dB}{dt} r = \frac{1}{2} (6.5 \times 10^{-3} \text{ T/s}) (0.0220 \text{ m}) = 7.15 \times 10^{-5} \text{ V/m} .$$

- (b) Now point at which we are evaluating the field is outside the solenoid and Eq. 31-29 applies. The magnitude of the induced field is

$$E = \frac{1}{2} \frac{dB}{dt} \frac{R^2}{r} = \frac{1}{2} (6.5 \times 10^{-3} \text{ T/s}) \frac{(0.0600 \text{ m})^2}{(0.0820 \text{ m})} = 1.43 \times 10^{-4} \text{ V/m} .$$