

27. We use the result of part (b) in Sample Problem 32-3:

$$B = \frac{\mu_0 \varepsilon_0 R^2}{2r} \frac{dE}{dt} \quad (\text{for } r \geq R)$$

to solve for  $dE/dt$ :

$$\begin{aligned} \frac{dE}{dt} &= \frac{2Br}{\mu_0 \varepsilon_0 R^2} \\ &= \frac{2(2.0 \times 10^{-7} \text{ T})(6.0 \times 10^{-3} \text{ m})}{(4\pi \times 10^{-7} \text{ T}\cdot\text{m/A}) \left(8.85 \times 10^{-12} \frac{\text{C}^2}{\text{N}\cdot\text{m}^2}\right) (3.0 \times 10^{-3} \text{ m})^2} = 2.4 \times 10^{13} \frac{\text{V}}{\text{m}\cdot\text{s}} . \end{aligned}$$