

**20.35. Solve:** (a) The intensity of a uniform spherical source of power  $P_{\text{source}}$  a distance  $r$  away is  $I = P_{\text{source}} / 4\pi r^2$ . Thus, the intensity at the position of the microphone is

$$I_{50\text{ m}} = \frac{35\text{ W}}{4\pi(50\text{ m})^2} = 1.11 \times 10^{-3}\text{ W / m}^2$$

(b) The sound energy impinging on the microphone per second is

$$P = Ia = (1.11 \times 10^{-3}\text{ W / m}^2)(1.0 \times 10^{-4}\text{ m}^2) = 1.11 \times 10^{-7}\text{ W} = 1.11 \times 10^{-7}\text{ J / s}$$

$$\Rightarrow \text{Energy impinging on the microphone in 1 second} = 1.11 \times 10^{-7}\text{ J.}$$