



Sound Intensity Practice Problems

1. Blue whales are the loudest creatures; they can emit sound waves with an intensity of $3.0 \times 10^{-3} \text{ W/m}^2$. If this intensity is measured 4.0 m from its source, what power is associated with the sound wave?
2. In 1983, Roy Lomas became the world's loudest whistler; the power of his whistle was $1.0 \times 10^{-4} \text{ W}$. What was the sound's intensity at 2.5 m?
3. Howler monkeys, found in Central and South America, can emit a sound that can be heard by a human several miles away. The power associated with the sound is roughly $3.0 \times 10^{-4} \text{ W}$. If the threshold of hearing of a human is assumed to be $1.1 \times 10^{-13} \text{ W/m}^2$, how far away can a howler monkey be heard?
4. In 1988, Simon Robinson produced a sound having an intensity level of $2.5 \times 10^{-6} \text{ W/m}^2$ at a distance of 2.5 m. What power was associated with Robinson's scream?
5. How much power is given off as sound from a gasoline-powered air compressor if the intensity of the sound is $4.6 \times 10^3 \text{ W/m}^2$ at a distance of 18 m?
6. A baseball coach shouts loudly at an umpire standing 5.0 meters away. If the sound power produced by the coach is $3.1 \times 10^{-3} \text{ W}$, what is the decibel level of the sound when it reaches the umpire?
(Let $I_0 = 1.0 \times 10^{-12} \text{ W/m}^2$)