Worksheet - Sound Intensity

1. ________________________ is a measure of the "loudness" of a sound. Why can't loudness be measured?

2. The equation for calculating sound intensity is  \( I = \) ________
   The MKS unit is the _____ per _____.

3. Sound waves travel from the source in the shape of a _________. The formula for the area of a sphere is  \( A = \) _________. Insert this into the intensity equation:  
   \[ I = \]

4. What is the intensity of a 1.5 w sound at a distance of 5.2m?

5. How much power does a sound source generate if the intensity is \( 2.4 \times 10^{-6} \) w/m\(^2\) at a distance of 2.3m?

6. An intensity of \( 1.0 \times 10^{-1} \) w/m\(^2\) can cause damage to the ears. If the power of sound from a rock band's amplifier is 85 w, how far are you standing from the speaker if you are damaging your ears?

7. Relative intensity, \( \beta \), is a way of expressing the ratio of the intensity of a sound to the ________________________ of hearing at that frequency. The ____________ is the unit for expressing relative intensity. Why is this called a dimensionless unit?