11. (25 points) A spherical sound wave is emitted by a point source. Relative to the sound level 1 m from the source, the sound level 5 m from the source is about: (HRK 20-22)

   a. 0 db  
   b. +7 db  
   c. -7 db  
   d. +14 db  
   e. -14 db

\[ SL_2 - SL_1 = 10 \log \frac{I_2}{I_1} \]

\[ I = \frac{P}{4\pi r^2} \]

\[ \frac{I_2}{I_1} = \frac{\frac{P}{4\pi r_2^2}}{\frac{P}{4\pi r_1^2}} = \left( \frac{r_1}{r_2} \right)^2 = \left( \frac{1 \text{ m}}{5 \text{ m}} \right)^2 = \frac{1}{25} \]

\[ SL_2 - SL_1 = 10 \log \frac{1}{25} = -14 \text{ db} \]