Answer on Question #48085-Physics-Acoustics

Area of a window is $A = 2 m^2$ & the intensity level at the open window is $\beta = 80 dB$. then, how much acoustic power enters the room ?

Solution

The intensity level is:

$$\beta = 10 \, \log_{10} \frac{I}{I_0},$$

where $I_0 = 10^{-12} rac{W}{m^2}$,

The sound intensity is

$$80 = 10 \, \log_{10} \frac{I}{10^{-12} \frac{W}{m^2}} \to I = 10^{-4} \frac{W}{m^2}.$$

The acoustic power is

$$P = IA = 10^{-4} \frac{W}{m^2} \cdot 2 m^2 = 2 \cdot 10^{-4} W.$$

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