Question:

An electric guitar amplifier is at a distance of 5.7m. Find the intensity of its sound waves when its power output is 0.30w Answer in units of W/m^2

Answer:

For a plane progressive wave we have:

$$I = \frac{P}{A}$$

where P is sound power or acoustic power, A is area.

Area equals:

$$A = 4\pi R^2$$

Therefore:

$$I = \frac{P}{4\pi R^2} = 0.000735 \frac{W}{m^2} = 7.35 \cdot 10^{-4} \frac{W}{m^2}$$

Answer: $7.35 \cdot 10^{-4} \frac{W}{m^2}$