Quiz #Ch17-1

Date: 2/2 /2016

Name: ID#: Sec#:

You are standing at a distance D from an isotropic point source of sound. You walk 50.0 m toward the source and observe that the intensity of the sound has doubled. Calculate the distance D.

$$∵ I=\frac{P}{A}=\frac{P}{4πr^{2}}$$

$$I\_{i}=\frac{P}{4πD^{2}} and I\_{f}=\frac{P}{4π(D-50)^{2}} $$

$$since I\_{f}=2I\_{i} then \frac{2P}{4πD^{2}} = \frac{P}{4π(D-50)^{2}}$$

$$thus \frac{2}{D^{2}} \frac{1}{\left(D-50\right)^{2}} ⟹ \sqrt{2} \left(D-50\right)=D ⇒ D=\frac{50}{\left(\sqrt{2}-1\right)}=120.7 m$$