Week 2 Quizbit - Roadmap Solution

Monday, April 10, 2023 10:39 AM

Physics 202

Quizbit | Two Source Interference

Part 1: Work individually to produce a handwritten solution to **the first part** of this Quizbit. Submit an image of your solution to Canvas. The quality of your solution and communication is far more important than the final answer!

Two spherical speakers playing a 686 Hz note are positioned 6.634 meters apart directly East and West of each other. You are standing directly North of one speaker, 10 meters in front of it.

Hints:
Path Length Difference!
$a^2 + b^2 = c^2$
$v = f\lambda$
$v_{\text{sound in air}} = 343$ m/s

(a) What is the wavelength of the sound? $\longrightarrow v = f\lambda$

(b) How far are you from the other speaker? $\longrightarrow a^2 - b^2 = c^2$
(hint: draw a picture!)

(c) Where you are currently standing, do you hear a loud or quiet note? Explain.

$PLD = P_2 - P_1$

$PLD = m\lambda$?

or

$PLD = (m + \frac{1}{2})\lambda$?

Part 2: As a group, assign roles to each member. One person should be the writer, one should be the recorder in charge of submitting the group solution to Canvas, and if you have a third member, they should be the advice giver. Make sure to rotate roles each week so that a different person is the writer each week. Work together to **produce a written solution to questions (a) through (c), then additionally answer question (d)**. Submit an image of your work to Canvas.

(d) You move slowly in a straight line to the East or West until you are standing equidistant (the same distance) from each speaker. How many quiet spots do you observe between the starting and ending locations?