Recitation 1

PH 203

TA : Pritha Biswas

Office Hours: Tues-(3-4)PM, Thus- (10-11) AM

- Lecture Hours: M 8AM, W 3 PM, F 9AM
- Recitation Hours: T 10AM;

Th 2pM, 3PM, 4PM, 5PM

- Email: biswasp@oregonstate.edu

Today's Topic:

- Getting used to with Zoom, Slack interface
- General two source Interference

Zoom & Slack

- Zoom:
- Recitation zoom session password- 203rec
- Attendance- Write your ONID in chat box
- Recitation is 5% of your grade
- Break out room- Use for discussion with peers. We encourage one student to share their screen (with the recitation template on it) then have every group member work together to "annotate" the template to solve the problem.
- Slack:
- #ph203_spring2020| Public channel for general discussion related to PH203
- #virtual_wormhole| Public channel to talk directly with TAs during wormhole hours
- #ph203e_lab| Public channel for general lab discussion. You will also be given a private lab channel for your group.

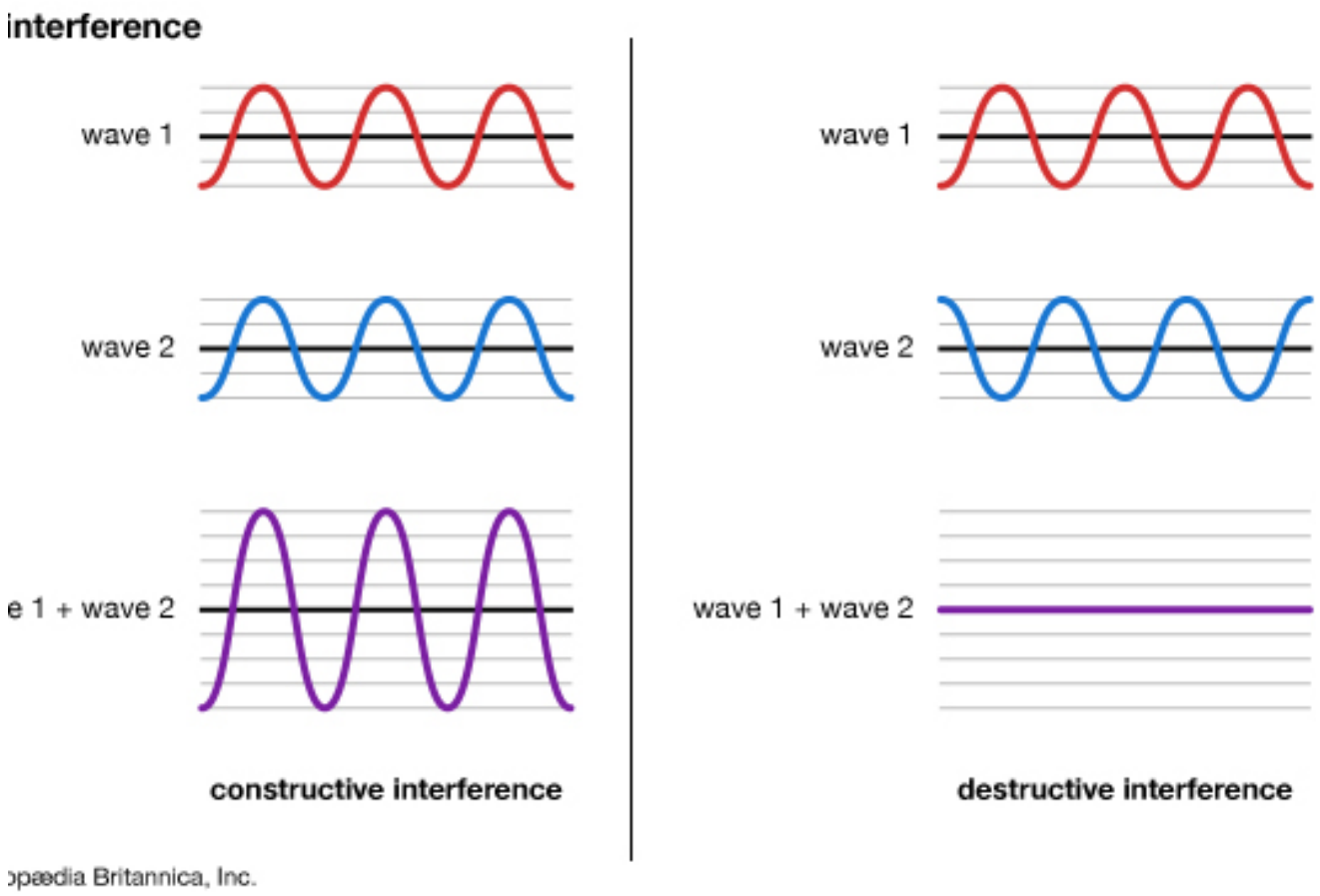
Two Source Interference: (Review)

- Two identical coherent sources (emit one frequency)

- Completely constructive

  PLD= mλ, m=0,1,2,3
- Completely destructive

  PLD= (m+1/2)λ, m=0,1,2,3



Practice qs 1:

- It is noticed that the shortest path length difference that produces constructive interference from an unknown source is 128 m.
- (a) What is the wavelength of the source?
- (b) At which of the following path length differences will constructive interference occur?

  (1) 64 m

  (2) 180 m

  (3) 256 m

  (4) 320 m

  (5) 512 m

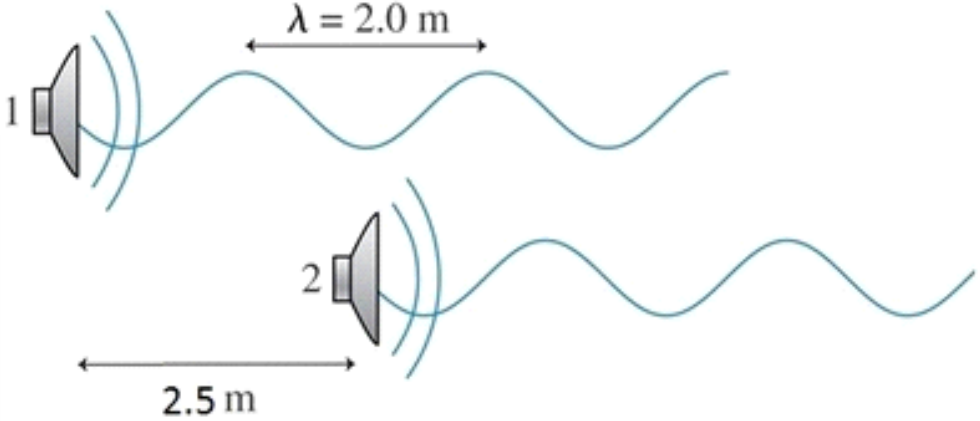
  (6) 832 m

  (7) 3264 m

  (8) 4096 m

Practice qs 2:

- Two loudspeakers emit (l = 2.0 m) waves that are in phase with each other. Speaker 2 is 2.5 m in front of speaker 1. What, if anything, must be done to cause completely constructive interference between the two waves?
- Move speaker 1 backward (to the left) 1.0 m.2.
- Move speaker 1 forward (to the right) 1.0 m.3.
- Move speaker 2 backward (to the left) 0.5 m.4.
- Move speaker 2 forward (to the right) 0.5 m.5.
- Move speaker 2 forward (to the right) 1.0 m.6.
- Move speaker 2 forward (to the right) 1.5 m.7.
- Nothing. The situation shown already causes constructive interference



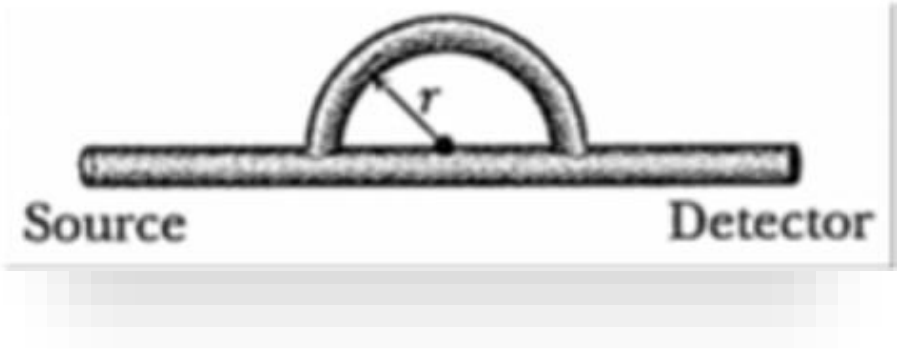
Challenge Homework SW.L2.4-01

- A 900 Hz sound wave is produced on the source side of the tube shown in the figure. The sound travels to the right along both the straight and the curved path to a detector. (a) What is the smallest value of r such that a minimum in sound intensity will be heard at the detector end? (b) What are the two smallest values of r such that a maximum in sound intensity will be heard at the detector end? (c) Use the Order of Magnitude sense-making technique to check your answer in part (b).

Hint:

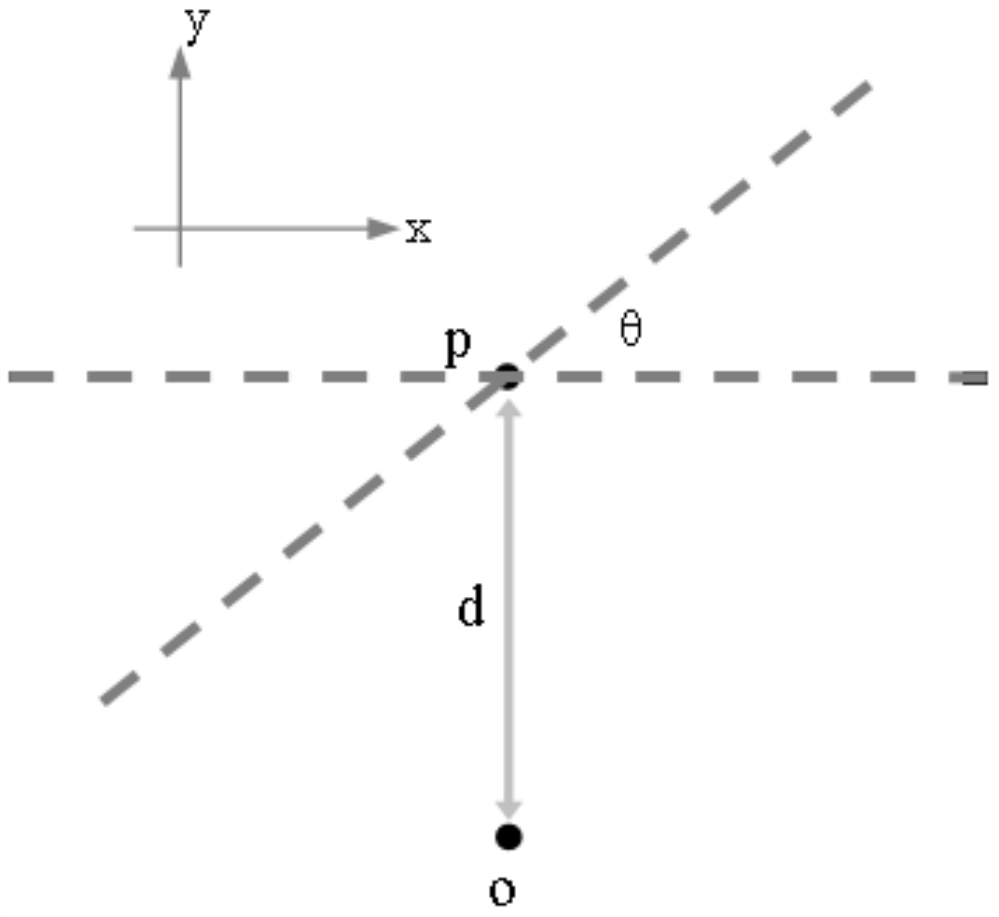
- Part A: What is the condition for minimum sound intensity?
- Try geometry to get the path length difference (PLD)

- Part B: What is the condition for maximum sound intensity?
- Try the same geometry



Challenge Homework SW.L2.4-01

- Two 100-m (λ), in-phase spherical wave sources are located at point **p** in the figure. An observer is located at point **o**, a distance of 10 m in the positive **y**-direction away from point **p**. If one of the wave sources moves at 2 m/s along a line 45º from the **x** axis, how long will it be before the observer detects another maximum. There may be more than one cor-rect answer.



Hint:

- Identify two interfering sources.
- Observer finds another maxima, condition for PLD?
- Use geometry to express PLD in terms of distance (x) covered by moving source.
- Solve the equation for x
- Get time from (Velocity = dist.*time) eq.