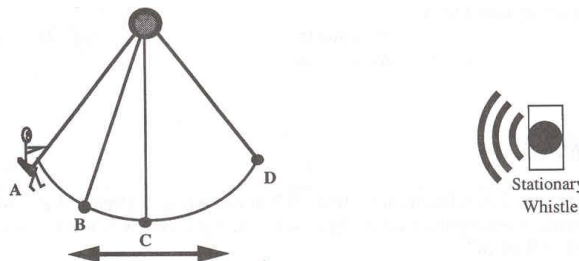


### Quiz #8: Waves and Interference

#### Problem 1 (1 point)

The diagram below shows the various position of a child in motion on a swing. Somewhere in front of the child a stationary whistle is blowing. At which position will the child hear the highest frequency for the sound from the whistle?

- a) at both A and D
- b) at B when moving toward A
- c) at B when moving toward C
- d) at C when moving toward B
- e) at C when moving toward D



#### Problem 2 (3 points)

Do the wavelength **and** frequency of the second harmonic on a string stretched between two supports increase, decrease, or remain the same if we (a) **decrease** the distance between the supports without increasing the tension, (b) **increase** the tension in the string without changing the distance between the supports, and (c) switch to a string with a **smaller** linear density without changing the tension or distance between the supports?

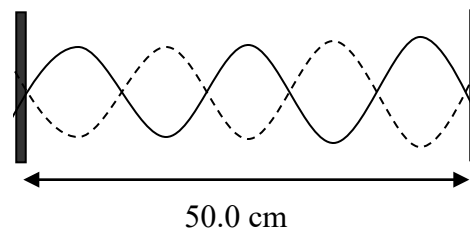
Wavelength

Frequency

- (a)
- (b)
- (c)

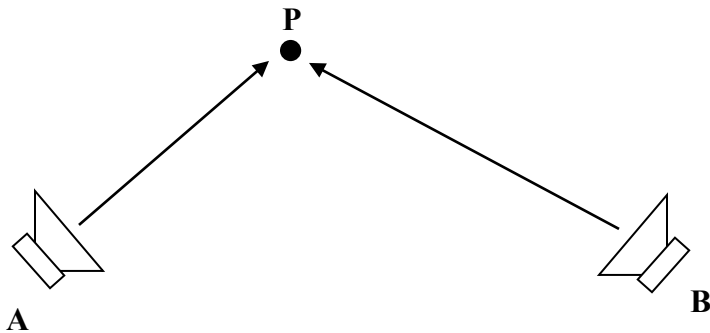
#### Problem 3 (3 points)

The following standing wave is produced on a string that is under a tension of 350 N. The linear density of the string is  $6.22 \times 10^{-2}$  kg/m. What is the frequency of the standing wave?



**Problem 4** (3 points)

A person is standing at point P, which is 5 m away from speaker A and 8 m away from speaker B as shown below. Both speakers vibrate in phase and play sound of the same frequency. Assume that the speed of sound is 343 m/s.



What are the two smallest frequency sound waves that the speakers can play so that a person at point P hears no sound?

