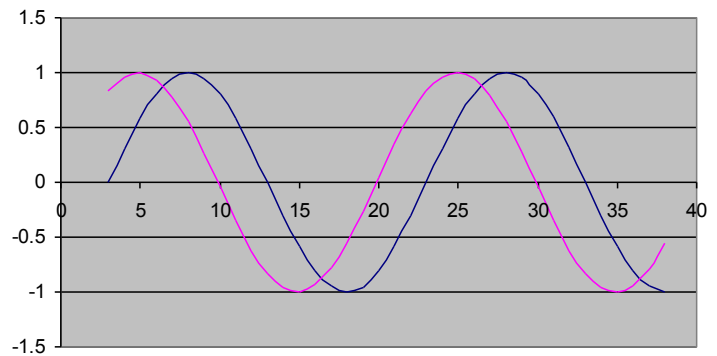


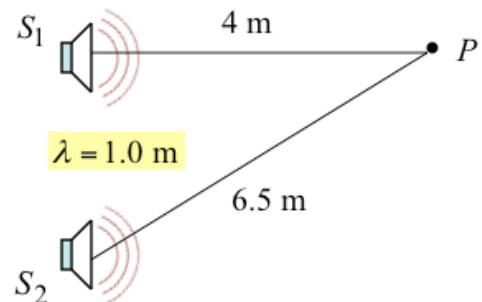
Lecture Activities **interference of sound waves** **Name:**
 Relevant textbook sections covered: 21.5 & 21.6

1. A 440 Hz sound wave in air has a speed of $v = 345 \text{ m/s}$.
 - (i) What's the wavelength?
 - (ii) At a particular instant, what is the phase difference (in rad) between two points 4.4 cm apart?
 - (iii) How much time is required for a phase change of $\Delta\phi = \pi/2$ (90°) for a given point in space?

2. What is the phase difference between the two waves in the figure? Sketch the resulting superposition of the two waves in the figure.

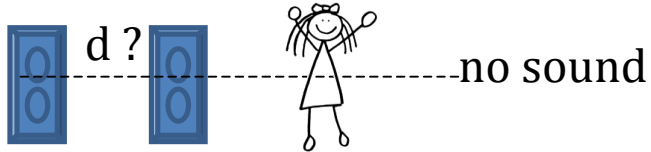


3. The two speakers are out of phase by π . How do the waves interfere at Point P? Constructively, destructively, or something in between?



4. Two in-phase loud speakers separated a distance d emit 170 Hz sound waves along the x-axis. As you walk along the central axis (away from the speakers), you don't hear any sound – even though both speakers are turned on.

- (a) What is the smallest distance for d for this to be true?
- (b) What other distances would still work (chose two).



5. Two radio antennas 600 m apart are emitting 3 MHz radio waves. The two antennas are out of phase by π (180° , or $\lambda/2$ out of phase).

Is point P a location of constructive interference, destructive interference, or something in between?

