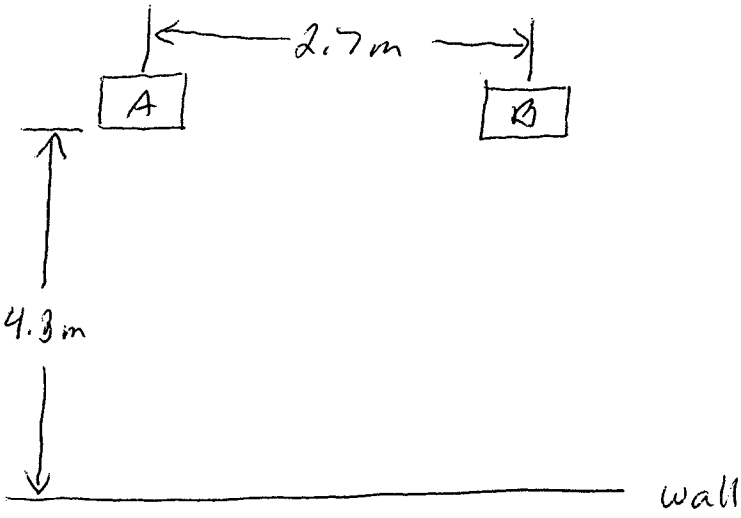
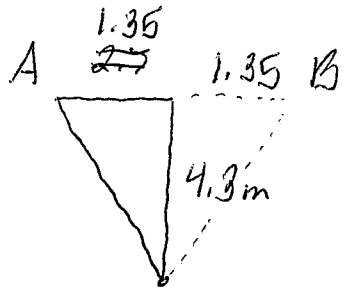


Speakers emit the same frequency, but are π rad out of phase.
(Use 343 m/s for sound speed)

1) Show that a point on the wall in front of the speakers that is centered between the speakers is a destructive interference point.



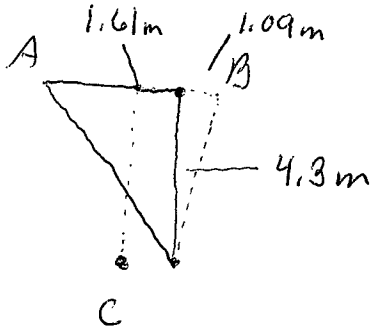
$$d_A = \sqrt{(1.35\text{m})^2 + (4.3\text{m})^2}$$

$$d_B = \sqrt{(1.35\text{m})^2 + (4.3\text{m})^2}$$

$d_A - d_B = 0 \Rightarrow$ destructive Interference

2) If a sensor is moved 0.26 m to either side of the central point in part 1, a 1st maximum is obtained. Determine the frequency of the speakers.

1st max ($n=1$) $\Rightarrow$ $d_A - d_B = \frac{n\lambda}{2} = \frac{\lambda}{2}$



$d_A = \sqrt{(1.61\,m)^2 + (4.3\,m)^2} = 4.592\,m$

$d_B = \sqrt{(1.09\,m)^2 + (4.3\,m)^2} = 4.436\,m$

$\lambda = 2(d_A - d_B)$

$= 2(4.592\,m - 4.436\,m)$

$= 0.312\,m$

$V = f\lambda$

$f = \frac{V}{\lambda} = \frac{343\,m/s}{0.312\,m} = 1.099E3\,Hz$

$\boxed{1100\,Hz}$