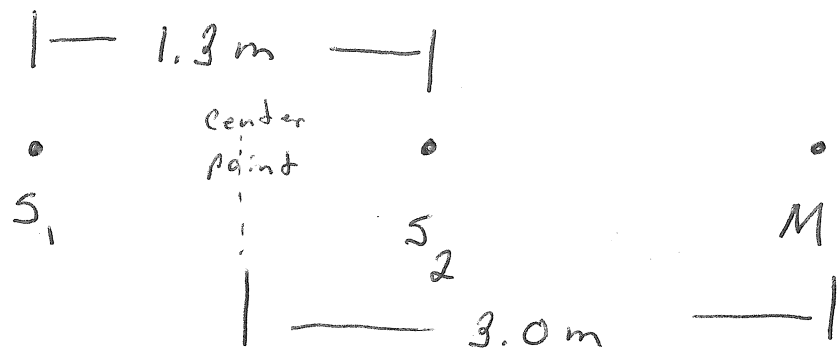


(1)

A microphone is located as shown below. Determine the lowest two frequencies that produce an interference maximum at the microphone. S_1 and S_2 are sources that emit in-phase waves.



$\Delta L = \frac{1}{2}\lambda$ for destructive interference

$$L_{S_1} - L_{S_2} = 3.65\text{ m} - 2.35\text{ m} = 1.30\text{ m}$$

1st

$$\frac{1}{2} \lambda = 1.30 \text{ m}$$

$$\lambda = 2.60 \text{ m}$$

$$v = 343 \text{ m/s}$$

$$v = f \lambda \quad f = \frac{v}{\lambda} = \frac{343 \text{ m/s}}{2.60 \text{ m}} = \boxed{132 \text{ Hz}}$$

2nd

$$\frac{1}{2} (3) \lambda = 1.30 \text{ m}$$

$$\lambda = 0.867 \text{ m}$$

$$f = \frac{343 \text{ m/s}}{0.867 \text{ m}} = \boxed{396 \text{ Hz}}$$