

Two sound sources of a wavelength $\lambda = 1.5$ mm, separated by a distance $d = 2.0$ mm, are radiating coherently and in phase. The speed of sound is $v = 340$ m/s.



- a) You wish to find the intensity of sound for an observer at a large distance L from the sources at an angle $\theta = 7^\circ$ from the perpendicular bisector of the line connecting the sources. Draw an accurate phasor diagram to represent the addition of the sound from the two sources. Label and calculate the angle between the phasors.
- b) The intensity of each source independently at a distance L is $I_0 = 2$ W/m². What is the total intensity at angle $\theta = 7^\circ$?
- c) Is there an angle between 0 and θ for which destructive interference occurs? Justify your answer in one or two sentences.