

Physics 1135: Homework for Recitation #27: Standing Waves, Wave Interference

1. The vibrating portion of a violin string has a length of 33cm and produces a fundamental frequency of 440 Hz (A_4) when played. How far from the end must the violinist put a finger to play a note of fundamental frequency 587Hz (D_5)?
2. A string of length 75.0cm has fixed ends. Two consecutive harmonics are 420Hz and 315 Hz. Find the wave speed and the fundamental frequency.
3. Two identical loudspeakers emit sinusoidal waves in phase and are 2m from each other. Point P is on the extension of the line connecting the speakers, 1.0m to the right of the right speaker. What is the lowest frequency for which you obtain constructive interference at point P? What is the lowest frequency for which you obtain destructive interference at point P?
4. A tuning fork produces a 440Hz tone. When the tuning fork is struck and held near a vibrating violin string, 10 beats are counted in five seconds. What are the possible frequencies produced by the string?