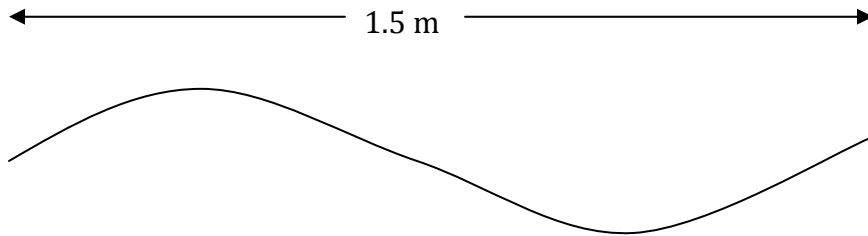


Physics 11/11H: Standing Waves Worksheet (Practice test)

Name: _____

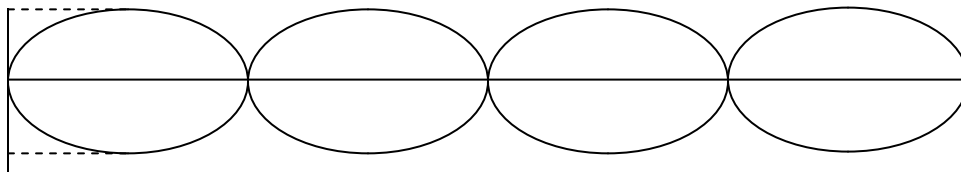
Show/explain all work, include diagrams, equations in symbols, appropriate significant digits, and unit.

1. A 1.5m long stretched string, fixed at both ends, is vibrated with a frequency of 585Hz. It vibrates as shown below:



- a) What is the speed of waves in the string?
b) What is the fundamental frequency of this string?
2. A string, fixed at both ends, is 85.0 cm long. If the speed of the waves on the string is 13.00 m/s, what are the first three natural frequencies (harmonics) that can be produced by the string?
3. Calculate the fundamental frequency sounded by a guitar string 105.0 cm long if the speed of sound in the string is 85.0 m/s?
4. A standing wave is produced with a wavelength of 0.60m, and a speed of 3.0m/s, on a string 3.6m in length. Both ends of the string are fixed. How far from the end are the **first two** anti-nodes?
5. A standing wave pattern is produced on a 2.20m long string as shown. The frequency of the wave is 225 Hz.

5.0cm



-5.0cm

- a) What is the value of the amplitude of the wave?
b) What is the wavelength of the wave?
c) What is the speed of the wave?

- d) Draw a diagram of what the wave would look like if the frequency were half the value.



6. What are the wavelengths of the 5 longest waves that can produce standing waves on a string of length 40.0 cm, fixed at both ends?
7. If the speed of the waves in a spring is 285 m/s, what are the frequencies that correspond with the wavelengths found in question 6?
8. What is the fundamental frequency sounded by a guitar string 60.0 cm long if the speed of sound in the string is 195 m/s?
9. A rope is fastened to a wall at one end. When the other end is shaken with a frequency of 20.0 Hz, a standing wave pattern occurs. If the speed of the waves in the rope is 35.0 m/s, how far away from the attached end are:
- a) the nearest antinode
 - b) the nearest node (not the node at the fixed end, but the first node found along the rope, away from the wall)
10. The distance between adjacent nodes in a stretched string is 35.0 cm.
- a) If the frequency of vibration is 350.0 Hz, calculate the speed of the wave.
 - b) If the frequency is reduced to 150.0 Hz, what is the new wavelength?