

Name: _____

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Chapter 19.1 Homework

Conceptual Physics

Parent Signature: _____

Each numbered question is worth one point unless otherwise noted.

Reviewing Concepts

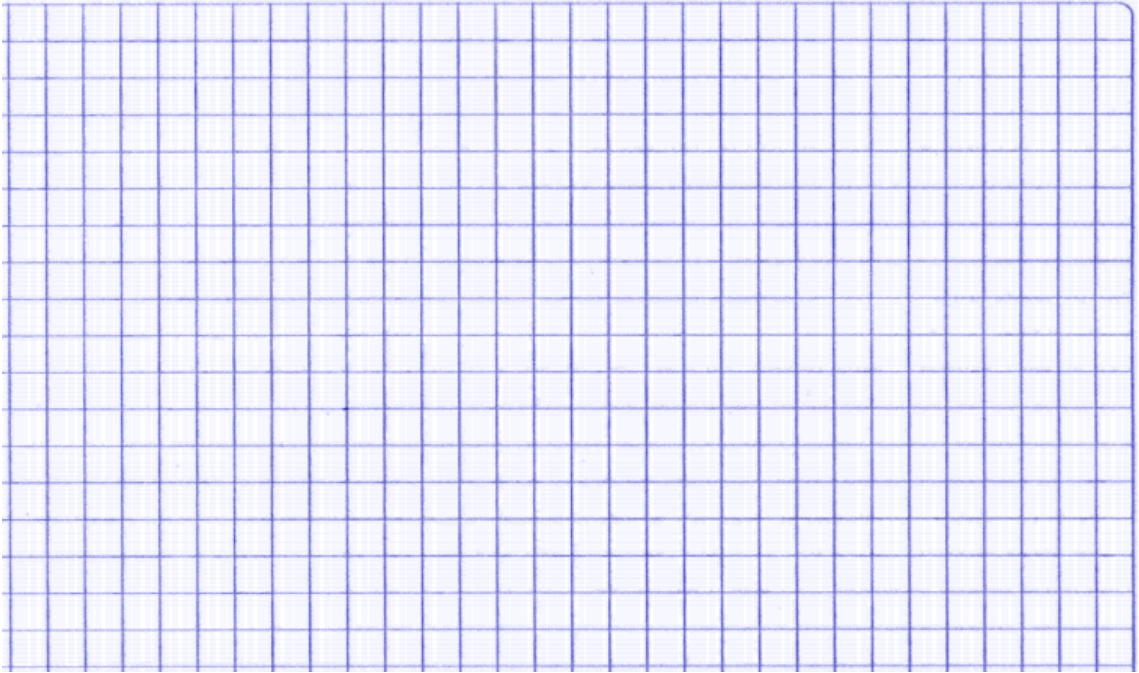
1. Identify how each of the following situations involves waves. Explain each of your answers. (2.5)
 - a. A person is talking to someone on a cell phone.
 - b. An earthquake causes the floor of a house to shake.
 - c. A person listens to her favorite radio station on the car stereo.
 - d. A doctor takes an x-ray to check for broken bones.
 - e. You turn on a lamp when you come home in the evening.
2. Compare transverse waves to longitudinal waves. Give two examples of each type of wave.
3. Arrange the equation relating wave speed, frequency, and wavelength for each of the following scenarios. Let v = wave speed, f = frequency, and λ = wavelength.
 - a. You know frequency and wavelength. Solve for v .
 - b. You know frequency and wave speed. Solve for λ .
 - c. You know wave speed and wavelength. Solve for f .
4. Write a formula relating the speed of a wave to its period and wavelength. (0.5)

5. Give one example of a wave with a very short wavelength and one with a very long wavelength.
6. In the diagram on page 464, which measurement shows the amplitude? _____
Which measurement shows the wavelength? _____ (0.5)
7. What causes a standing wave?
8. How many nodes and antinodes are in a single wavelength of the second harmonic of a vibrating string?

Solving Problems

1. A wave has a frequency of 10 Hz and a wavelength of 2 m. What is the speed of the wave?
2. A sound wave has a speed of 400 m/s and a frequency of 200 Hz. What is its wavelength?
3. The wavelength of a wave on a string is 1 m and its speed is 5 m/s. Calculate the frequency and the period of the wave.

4. Draw at least one cycle of a transverse wave with an amplitude of 4 cm and a wavelength of 8 cm. (2)



If the frequency of this wave is 10 Hz, what is its speed? (1)

5. The standing wave pattern shown on page 465 has a frequency of 30 Hz. (2.5)
- What is the period?
 - At what frequency will you find the fourth harmonic?
 - At what frequency will you find the fifth harmonic?
 - How many nodes are in this wave pattern?
 - How many antinodes are in this wave pattern?
6. You are doing a vibrating string experiment and observe the sixth harmonic at 48 Hz. At what frequency do you find the third harmonic?
7. How many nodes and antinodes does the standing wave pictured on page 465 have?
8. An "A" note played on a piano vibrates at a frequency of 440 Hz. Find the frequency for its second harmonic.