Final Exam
Waves Review

Chapter 25, 26

Equations:

$$f = \frac{1}{T} \qquad v = \lambda f$$

Concepts:

1. ___ Frequency 2. ___ Period 3. ___ amplitude 4. ___ longitudinal wave 5. ___ transverse wave 6. ___ law of reflection 7. ___ node 8. ___ antinode 9. ___ wave speed 10. ___ fundamental frequency	a. a region of destructive interference b. the angle of incidence is equal to the angle of reflection c. displacement is perpendicular to direction of wave motion d. does not change if the medium remains the same. e. measured in seconds f. maximum displacement h. will produce a standing wave with no nodes. i. number of waves per second j. sound waves k. region of constructive interference

Problems:

1. Some happy physics students are making a standing wave in a 5 m long slinky. One of the students is shaking it with a frequency of 2 Hz, and the resulting standing wave has 2 nodes (not including the ends of the slinky).
   a. Draw a picture of this situation.

   b. What is the period of the motion?

   c. What is the wavelength of the motion?

   d. What is the speed of the wave?

   e. If the student doubles the frequency of the shaking, what will happen to the speed of the wave?

   f. If the student doubles the frequency of the shaking, what will happen to the wavelength of the wave?

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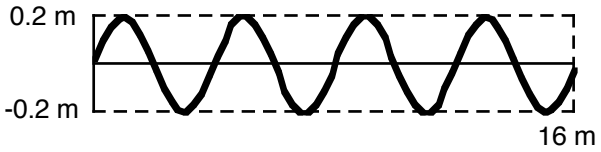
g. The students wanted to create the longest possible wavelength for a standing wave in a string 5 meters long. What is the longest wavelength? (Hint: How many nodes would there be?)

h. With what frequency should that shake the slinky to create this wavelength?

i. What should the students do if they want to increase the speed of the wave in the slinky?

2. The picture shows a "snapshot" of a wave. It has a frequency of 50 Hz.



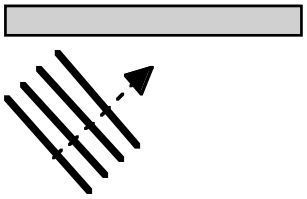
a. What is the amplitude of the wave?

b. What is the wavelength of the wave?

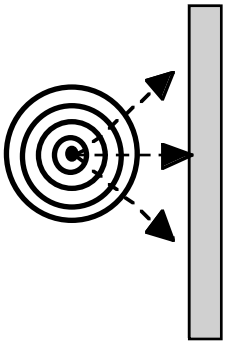
c. What is the speed of the wave?

3. For each of the pictures of waves and barriers below, draw what will happen to the waves shown, and what is the name for the phenomenon?

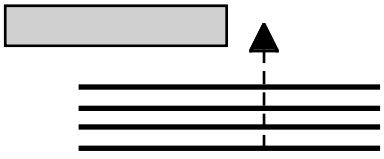
a.



b.



c.



d.