

## PHYSICS 11 WAVES WORKSHEET 1

**Refer to your notes as well as Chapter 14 of the text to answer the following questions.**

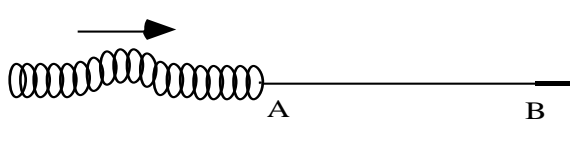
1. Determine the speed of a periodic wave disturbance that has a frequency of 2.50 Hz and a wavelength of 0.600 m.
2. What is the wavelength of a water wave that has a frequency of 2.50 Hz and a speed of 4.0 m/s?
3. The speed of a transverse wave in a string is 15.0 m/s. If a source produces a disturbance with a wavelength of 1.25 m, what is the frequency of the wave?
4. The period of a sound wave from a piano is  $1.18 \times 10^{-3}$  s. If the speed of the wave in air is  $3.4 \times 10^2$  m/s, what is its wavelength?
5. If an FM radio station transmits radio signals that have a wavelength of 3.2 m, and radio waves travel at the speed of light, where would you have to adjust your tuner in order to pick up its music? Check your formula sheet to find the speed of light, and note that FM waves are measured in MHz ( $10^6$  Hz)
6. A given crest of a water wave requires 5.2 s to travel between two points on a fishing pier located 19 m apart. It is noted in a series of waves that 20 crests pass the first point in 17 s.
  - a) What is the speed of the waves?
  - b) What is the wave frequency?
  - c) What is the wavelength of the waves?
7. Five pulses are generated every 0.100 s in a tank of water. What is the speed of propagation of the wave if the wavelength of the surface wave is 1.20 cm?
8. You are creating waves in a rope by shaking your hand back and forth. Without changing the distance your hand moves, you begin to shake it faster and faster. What happens to each of the following aspects of the wave:
  - a) amplitude.
  - b) frequency.
  - c) period.
  - d) velocity.
9. Two men are fishing from small boats located 30 m apart. Waves pass through the water, and each man's boat bobs up and down 15 times in 1.0 min. At a time when one boat is on a crest, the other one is in a trough, and there is one crest between the two boats.
  - a) Find the frequency of the waves.
  - b) Determine their wavelength.
  - c) What is the speed of each wave?

1. 1.50 m/s 2. 1.6 m 3. 12.0 Hz 4. 0.40 m 5. at 93.8 MHz 6. a) 3.7 m/s b) 1.2 Hz c) 3.1 m 7. 0.60 m/s  
8. a) nothing b) increases c) decreases d) nothing 9. a) 0.25 Hz b) 20 m c) 5.0 m/s

## PHYSICS 11 WAVES WORKSHEET 2

Refer to your notes and Chapters 14-15 of the text to answer the following questions.

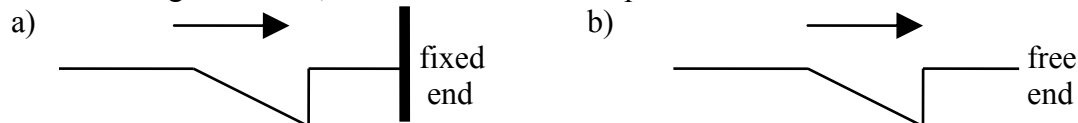
1. In the following figure, a pulse is sent along a spring. The spring is attached to a light thread that is attached to the wall.



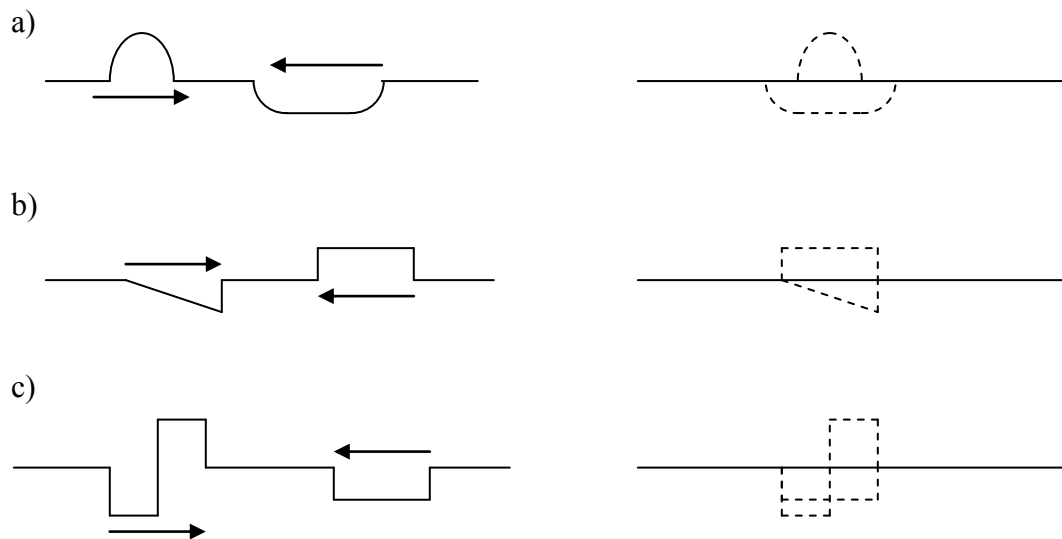
After the pulse reaches point A, is the pulse that reflects back **erect** or **inverted**? Explain how you know. How about point B?

2. As water waves approach a beach, their wavelengths become shorter; why?

3. For each diagram below, sketch in the reflected pulse created.

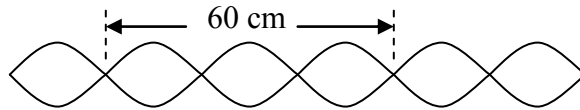


4. Wave pulses move towards each other from opposite directions as illustrated. Sketch the resultant shape of the medium when the two pulses are superimposed in the center.

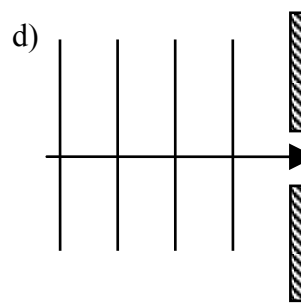
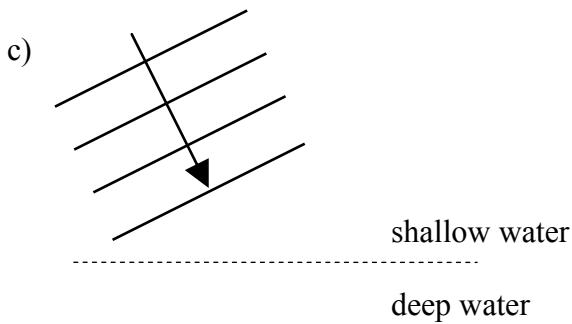
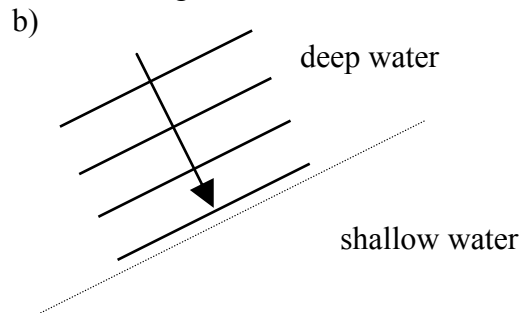
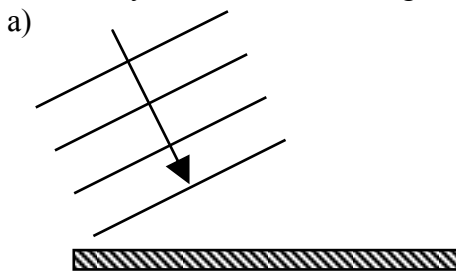


5. A standing wave interference pattern is produced in a rope by a vibrator with a frequency of 28 Hz. If the wavelength of the waves is 20 cm, what is the distance between successive nodes?

6. The distance between the second and fifth nodes in a standing wave is 60 cm.



- a) What is the wavelength of the waves?  
 b) What is the speed of the waves, if the source has a frequency of 25 Hz?
7. Standing waves are set up in a string by a source vibrating at 100 Hz. Seven nodes, similar to the pattern shown in question 3, are counted in a distance of 63 cm.
- a) What is the wavelength of the waves traveling in the string?  
 b) What is the speed of these waves?
8. Waves traveling along a string have a wavelength of 2.4 m. When the waves reach the fixed end of the string, they are reflected. How far from the end are the first two antinodes?
9. Accurately draw the resulting waves for each of the diagrams shown:



10. The speed of water waves is 30 cm/s in deep water and 15 cm/s in shallow water. If the wavelength in deep water is 1.0 cm, what is the wavelength in shallow water?
11. Sound waves in cold air have a speed of 320 m/s and a wavelength of 3.0 m. If the wavelength of these waves increases to 3.6 m in warm air, what is their new speed?

1. erect; inverted 2.  $v$  decreases as water depth decreases 3. a) b)
4. see notes 5. 10 cm 6. a) 40 cm b) 10 m/s 7. a) 21 cm b) 21 m/s 8. 0.6 m, 1.8 m 9. refer to notes  
 10. 0.50 cm 11. 384 m/s