DUE: WEDNESDAY FEBRUARY 11, 2009

Assigned reading: Giancoli, Chapter 16, sections 1–7.

1. True/false questions: For each of the following statements, indicate whether the statement is true or false. Briefly explain your reasoning (for example, if false, provide a counter-example).

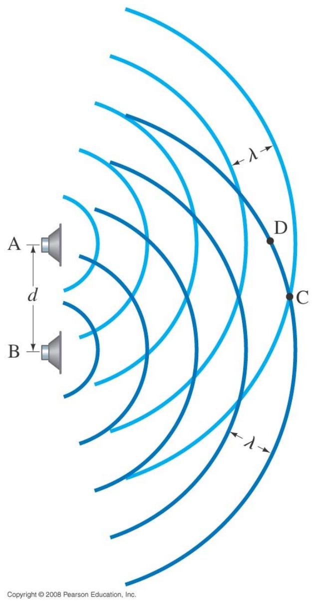
   (a) When a sound passes from air into water, both the frequency and the wavelength of the sound wave change.

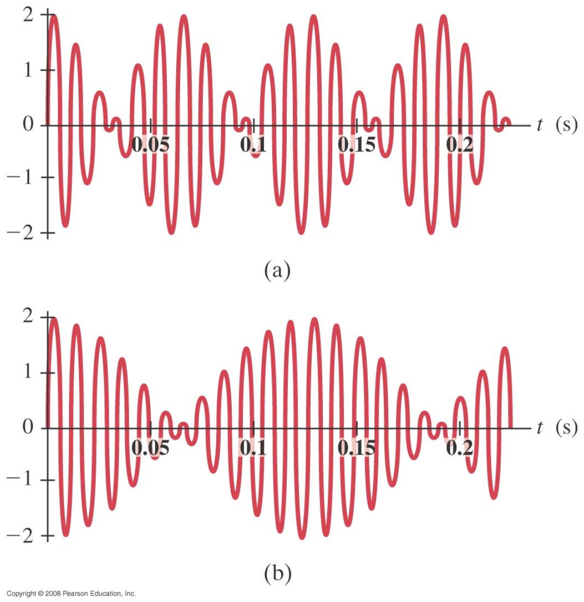
   (b) The speed of sound in hydrogen is greater than the speed of sound in air.

   (c) Two tuning forks oscillate with the same amplitude, but one has twice the frequency. Both tuning forks produce sounds of equal intensity.

   (d) When a musician plays a clarinet (cf. Fig. 16-10 of Giancoli on p. 433), she creates a pressure wave at the mouthpiece of the instrument. When this pressure wave reaches the (opposite) open end of the instrument, the wave is mostly reflected back to the mouthpiece.

   (e) In the figure shown below, if the common frequency of the two speakers is lowered, the points D and C (where destructive and constructive interference take place, respectively) move farther apart.





(f) Consider the two waves shown above. Each wave can be thought of as a superposition of two sound waves with slightly different frequencies (as illustrated in Fig. 16-17 of Giancoli on p. 438). The difference between the two component frequencies is larger for the wave shown in figure (b) above as compared to figure (a).

To earn full credit on the following problems, you must exhibit the steps that lead to your final results. The graded homework will be based on the clarity of your method of solution as well as on your final answer.

2. Giancoli, Chapter 15, problem 50
3. Giancoli, Chapter 15, problem 64
4. Giancoli, Chapter 16, problem 8
5. Giancoli, Chapter 16, problem 18
6. Giancoli, Chapter 16, problem 19
7. Giancoli, Chapter 16, problem 30
8. Giancoli, Chapter 16, problem 40
9. Giancoli, Chapter 16, problem 45
10. Giancoli, Chapter 16, problem 58
11. Giancoli, Chapter 16, problem 60