DUE: WEDNESDAY JANUARY 23, 2008

Assigned reading: Giancoli, Chapter 13, sections 10–13, and Chapter 14, sections 1–2.

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) A stream of water from a faucet becomes narrower as it falls.
   (b) As water in a level pipe passes from a narrow cross section of pipe to a wider cross section, the pressure against the walls decreases.
   (c) The roots of a fully grown redwood tree absorb water that is subsequently transported to its top leaves. This can be accounted for by the pressure difference between atmospheric pressure and the pressure of the water at its highest point in the tree. (If true, estimate the maximum height of the redwood tree. If false, what physical principle do you need to invoke?)
   (d) The acceleration of a simple harmonic oscillator is never zero.
   (e) Real springs have mass. The true period and frequency of a mass oscillating at the end of a real (massive) spring will be smaller than given by the equations for a mass oscillating at the end of an idealized massless spring.
   (f) Two equal masses are attached to separate identical springs. One mass is pulled so that its spring stretches 20 cm, and the other mass is pulled so that its spring stretches only 10 cm. Both masses are released simultaneously. The second mass, whose spring was initially stretched by 10 cm, reaches its equilibrium point first.
2. Giancoli, Chapter 13, problem 58
3. Giancoli, Chapter 13, problem 59
4. Giancoli, Chapter 13, problem 69
5. Giancoli, Chapter 13, problem 76
6. Giancoli, Chapter 14, problem 10
7. Giancoli, Chapter 14, problem 14
8. Giancoli, Chapter 14, problem 22
9. Giancoli, Chapter 14, problem 24
10. Giancoli, Chapter 14, problem 25