DUE: WEDNESDAY FEBRUARY 18, 2009

ANNOUNCEMENT: Monday February 16 is Presidents' Day; no classes will be held on that day. Consequently, my usual Monday office hours next week will be rescheduled for Tuesday from 11:30 am–12:30 pm. The Monday discussion section of Glenn Gray is cancelled, but Glenn will hold an extra midterm review section on the Thursday before the second midterm (more details next week).

Assigned reading: Giancoli, Chapter 16, sections 7 and 8, Chapter 31, sections 6 and 7, and Chapter 32, sections 1–4.

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) There is no Doppler shift if the source and the observer move in the same direction, with the same velocity.

   (b) Since no particle can travel faster than the speed of light, there is no analog of the sonic boom for light waves.

   (c) An electromagnetic wave can travel through a perfect vacuum.

   (d) The wavelengths of radio and television signals are longer than those detectable by the human eye.

   (e) If a concave mirror produces a real image, then the image is necessarily inverted.

   (f) An object is placed along the principal axis of a spherical mirror. The magnification of the object is -3.0. Then, the image of the object is real and inverted.

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 16, problem 66

3. Giancoli, Chapter 16, problem 72

4. Giancoli, Chapter 31, problem 17

5. Giancoli, Chapter 32, problem 4
6. Giancoli, Chapter 32, problem 6
7. Giancoli, Chapter 32, problem 16
8. Giancoli, Chapter 32, problem 18
9. Giancoli, Chapter 32, problem 20
10. Giancoli, Chapter 32, problem 28
11. Giancoli, Chapter 32, problem 36