DUE: WEDNESDAY MARCH 11, 2009

Assigned reading: Giancoli, Chapter 34, sections 4–7, Chapter 35, sections 1–6.

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) The light from the two headlights of a distant car produces an interference pattern.

   (b) When a thin layer of oil lies on top of water, one can often see swirls of color. This phenomenon arises as a result of the dispersion due to differences in the index of refraction of the oil and water as a function of the wavelength of light.

   (c) A radio can receive a radio signal behind a hill, even if there is no direct "line of sight" between the radio and the transmitting antenna.

   (d) If the first off-center maximum of one circular diffraction pattern passes through the center of a second diffraction pattern, the two sources responsible for the pattern will appear to be a single source.

   (e) It is not possible to resolve details of objects smaller than the wavelength of the radiation being used as a probe.

   (f) Diffraction effects can occur for virtual images.

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 34, problem 19

3. Giancoli, Chapter 34, problem 22

4. Giancoli, Chapter 34, problem 32

5. Giancoli, Chapter 34, problem 33

6. Giancoli, Chapter 34, problem 34

7. Giancoli, Chapter 35, problem 10

8. Giancoli, Chapter 35, problem 12
9. Giancoli, Chapter 35, problem 18
10. Giancoli, Chapter 35, problem 23
11. Giancoli, Chapter 35, problem 28