PHYSICS 2424  
Spring 1999  
Unit 5 - Geometric Optics

Reading: Sections 23.0 - 23.10
Homework: Chapter 23 – Questions 1,9,19  
Problems 1,8,11,20,29,35,36,43,47,49,52,60,65,77,83  
Problem A (on this sheet)

Dates:
• Reading Questions (Chapter 23) .......... Wednesday, March 10*
• Homework Due ................................ Tuesday, March 23  
• Unit 5 Quiz ................................... Tuesday, March 23

* This date is different than the due date in the syllabus.

Homework is due by 5:00 p.m. It may be turned in during class on Tuesday, or placed in the box outside of my office.

Reading questions are to be submitted directly from the World Wide Web using the form available at http://www.nhn.ou.edu/~strauss/phys2424. If you try to submit answers to the reading questions on the web, but the answers are rejected, please e-mail me at mgstrauss@ou.edu and describe the problem in detail.

READING QUESTIONS FOR CHAPTER 23:
1. Describe the ray model of light.  
2. Define the index of refraction for a material.  
3. What can be said about the numerical value of the index of refraction?  
4. What is the law of reflection?  
5. Which angle is always used when applying the law of reflection?  
6. Define the following terms: image distance, object distance, virtual image, real image, magnification, principal axis.  
7. Describe the image produced by a plane mirror using terminology from question 6.  
8. What is the focal point for a spherical mirror and how does it relate to the radius of curvature?  
9. What are concave and convex mirrors?  
10. What kind of images do each produce?  
11. What phenomena does “Snell’s law” describe?  
12. Describe total internal reflection.  
13. What are converging and diverging lenses?  
14. What kind of images do each produce?  
15. What are the general principles required to solve problems with more than one lens or mirror?  
Final Question: What is one thing from the chapter that you didn’t understand or need clarified?

Problem A:
An object is placed midway between a lens and a mirror as shown in the figure. The mirror has a radius of curvature of 20.0 cm and the lens has a focal length of -16.7 cm. Consider only the light that leaves the object and travels first toward the mirror.

(a) Where is the image formed from just the mirror?
(b) Where is the final image formed by the entire system?
(c) What is the overall magnification of this system?
(d) Is the final image real or virtual?
(e) Is the final image upright or inverted?