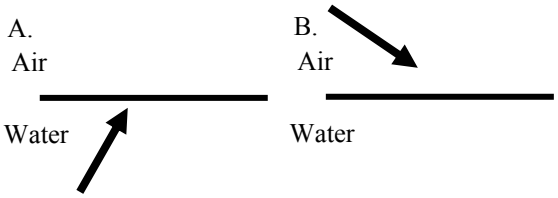
PreAP: Due Wed., Mar 29 (Assigned Mon., Mar 27)
Reg. Due Thurs., Mar 30 (Assigned Tues., Mar 28)

Light 5

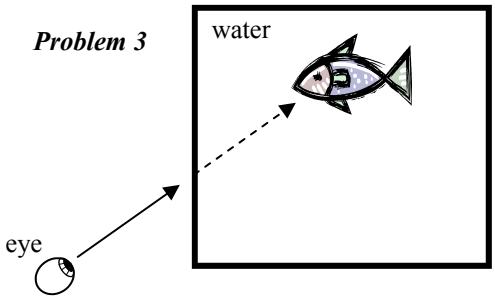


1. Does light move faster or slower in water than in air?

2. Using graphics A. and B. at the right, draw what will happen to the light rays when they pass out of and into water.

3. On the graphic at the right, draw where the fish might be. (Doesn't have to be perfect.)

Problem 3



A convex lens has a focal length of 4 cm. A 2 cm object is placed to the left of it. Answer the following questions and situations.

4. Situation 1: the object is placed inside the focal point at 3 cm.
   A. Find where the image appears to be.

   B. Find the height of the image.

5. Situation 2: the object is placed at the focal point.
   A. Find where the image appears to be.

   B. Find the height of the image.

6. Situation 3: the object is placed outside the focal point at 6 cm.
   A. Find where the image appears to be.

   B. Find the height of the image.

7. Situation 4: the object is placed at the radius of curvature "C" (see your variable chart).
   A. Find where the image appears to be.

   B. Find the height of the image.

8. Situation 5: the object is placed outside the radius of curvature, at 10 cm.
   A. Find where the image appears to be.

   B. Find the height of the image.

9. (Use above information to answer) Real or Virtual?
   A. If the object is inside the focal point ($p<f$), the image is real/virtual?
   B. If the object is at the focal point ($p = f$), the image is real/virtual?
   C. If the object is between the focal point and the radius of curvature ($f<p<C$), the image is real/ virtual?
   D. If the object is at the radius of curvature ($p = C = 2f$), the image is real/virtual?
   E. If the object is outside the radius of curvature ($p>C$), the image is real/virtual?

10. Use the information on the previous page to answer the following.
    A. If the object is inside the focal point (p<f), the image is magnified or reduced?
    B. If the object is at the focal point (p = f), the image is magnified or reduced?
    C. If the object is between the focal point and the radius of curvature (f<p<C), the image is magnified or reduced?
    D. If the object is at the radius of curvature (p = C = 2f), the image is magnified or reduced?
    E. If the object is outside the radius of curvature (p>C), the image is magnified or reduced?

    (You may want to keep notes on what you just did.)

11. If light enters water at 25° to the normal, what angle will it have in the water? (See previous notes for indexs of refraction.)

12. If light leaves glass at an angle of 30° to the normal, what angle will it have when it enters air?

Honors only from here on.

13. What is a diffraction gradient and what did it do for the laser beam?

14. When we put light through the diffraction gradient, did the dots get brighter or dimmer as the moved away from the center?

15. Why do the dots occur?

16. What is a minimum?

17. What is a maximum?

18. The angle between the central point to the first maximum is 15 degrees. If the wavelength of the light used is 750 nm, find the distance between the slits.

19. Using the information from problem 18, find the second maximum's angle.

20. If you are standing 2 meters away with the gradient, how much distance is there between the central point and the first maximum on the wall (in #18).