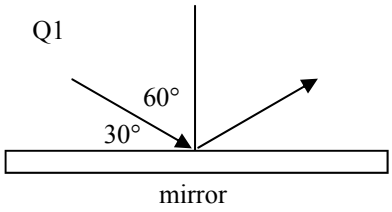
PreAP: Due Tues., Apr 4 (Assigned Fri., Mar 31)
Reg. Due Mon., April 3 (Assigned Fri., Apr 1)

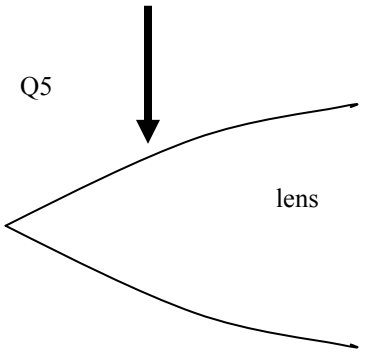
Light 7

1. What is the angle of reflection for the diagram at the right?
2. What is the focal length of the mirror?
3. Which is the real side of the mirror: top or bottom?
4. Why does light refract? (Be specific as to direction, too.)



5. Using the graphic at the right, show what will happen to the light ray as it passes thru the glass lens. (Make sure it goes all the way thru.)

6. A ray of light is traveling at 30° in water. What angle will it end up going if it passes into glass? *(See notes "Lesson Plans Mar 23 and 24" for indexes of refraction.)*



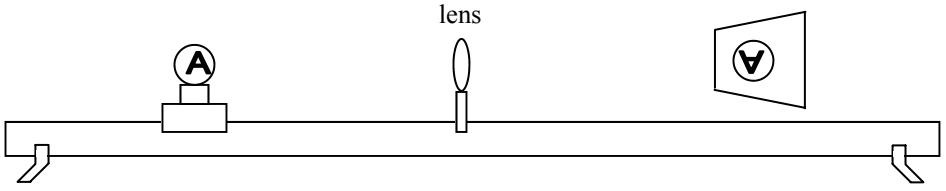
7. A ray of light is traveling at 30° in water. What angle will it end up going if it passes into air?

8. In which of the two substances does the light bend more: glass or water?

9. Find the critical angle for light passing from glass to water.

10. What is the speed of light in a diamond?

11. On the graphic below,
    A. Mark p, q, h, and h'.
    B. Label what kind of lens it is.
    C. If p = q, mark the focal length and radius of curvature on the meter stick with dots labeled "f" and "C".
    D. Real or virtual image?
    F. + or –: p ____; q ____; f ____; h ____; h' ____.
    G. Determine the magnification of the lens.



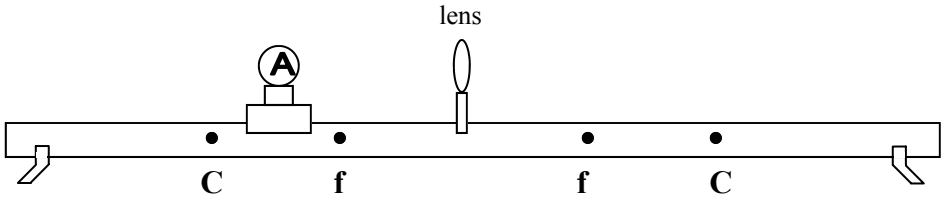
12. A 4 cm object is 6 cm in front of a convex mirror with a radius of curvature of 10 cm.
    A. Find the distance to the image.

    B. Find the height of the image.

    C. Find the magnification.

    D. Is it a real or virtual image?

Light 7

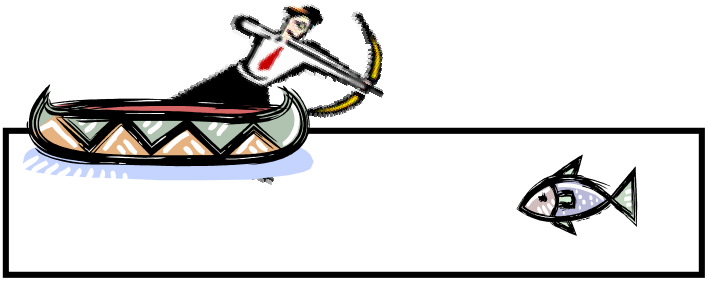


13. Use the above setup to answer the following questions.
    A. Label the object.
    B. Will the image be real or virtual?
    C. Will the image be magnified, reduced, or 1?
    D. Which way would you move the object to increase the size of the image?
    E. Draw where you think the image might be.
    F. Where would you put the object is you wanted a magnification of 1?

14. (From the July 2004 Exit Level TAKS test.) When trying to spear a fish in water, a person needs to take into account the way light bends as it moves from water into air. The bending of light as it passes from one medium into another is know as—

15. Will the man's arrow hit the fish and why or why not?

16. If the fish seems to be at an angle of 60°. At what angle is the fish really under the water (and at what angle should the man be aiming)?

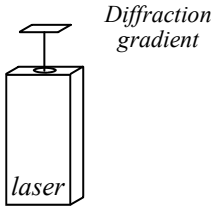


17. After shooting a cannonball, a cannon recoils (moves backwards) with a much lower velocity than the cannonball. This is primarily because, compared to the cannonball, the cannon has a —
    A. Much greater mass
    B. Smaller amount of momentum
    C. Greater kinetic energy
    D. Smaller force applied to it.

18. Give one of the two laws that applies to the above situation.

19. Use the diffraction gradient diagram at the right to answer the following.
    A. The central peak is ____.
    B. The first maximums is _____.
    C. The second maximum is _____.
    D. The brightest dot is _____.
    E. The dimmest dot is _____.

20. Because of _____ the light is bending, but why are there dots of light and not a continuous band of bent light? (Explain fully.)



Honors Only

21. There is 25 cm from the diffraction gradient to the central peak and 9 cm from B to C. If the laser uses light of 480 nm, find the space between the lines in the gradient.