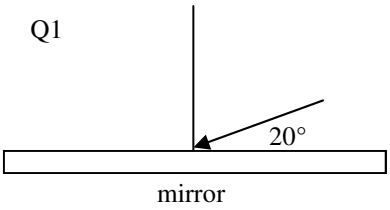
A-day: Due Tues., Mar 25 (Assigned Thurs., Mar 13)
B-day: Due Wed., Mar 26 (Assigned Fri., Mar 14)

2008 Light 7

1. What is the angle of reflection for the diagram at the right? (And draw it).
2. Using the RGB model for color:
   A. What is the background color? ____ B. How would you make white? ____
   C. How would you make magenta? ____ D. How would you make Red? ____
   E. How would you make black? ____

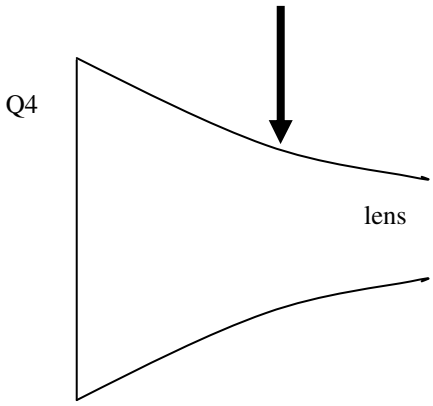
Q1



3. Using the CMYK model for color:
   A. What is the background color? ____ B. How would you make white? ____
   C. How would you make cyan? ____ D. How would you make Blue? ____
   E. How would you make black? ____

4. 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; think about the path and which side is faster, etc*.)
   What kind of lens is it in the graphic?

Q4



5. A light ray is traveling at 20° in water.
   A. Does light travel faster or slower in air?

   B. What is the index of refraction for water? _____ air? _____

   C. Does the ray bend toward or away from the normal as it passes into air?

   D. What is the index of refraction for glass? _____

   E. Will it bend towards or away from the normal is it passes into glass instead of air?

6. Find the critical angle for light passing from ice to air.

7. What is the critical angle of light passing from air to ice?

8. If a radio wave has a wavelength of 4.5 m, find its frequency.

9. If light is travels 2.06 x 10^8 m/s in a crystal substance. Using the chart at the right (and a little calculating) figure out what substance it is.

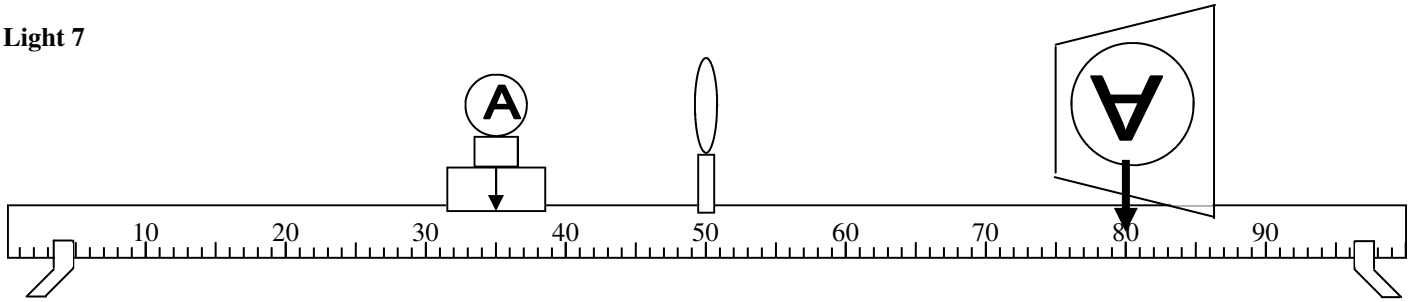
Material	n
Cubic zirconia	2.2
Zircon	1.923
Quartz	1.458
Sodium Chloride	1.544

10. A 4 cm object is 6 cm in front of a *concave* lens with a radius of curvature of 10 cm.
    A. Is the focal length for this lens positive or negative? B. In the equation, will f be + or –?
    C. If C = 2f, f =

    D. Find the distance to the image.

    E. Find the height of the image. F. Find the magnification.

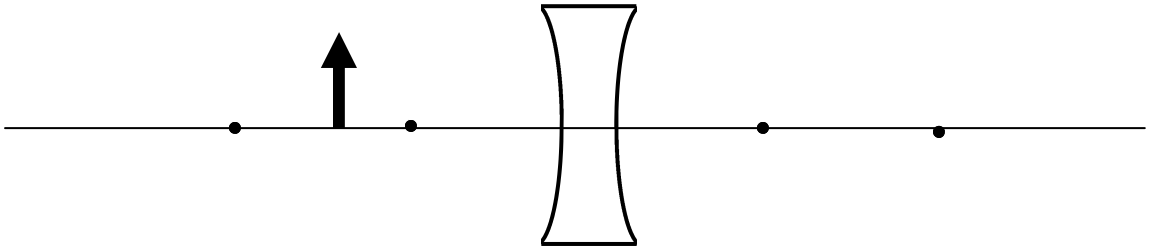
    D. Is it a real or virtual image?

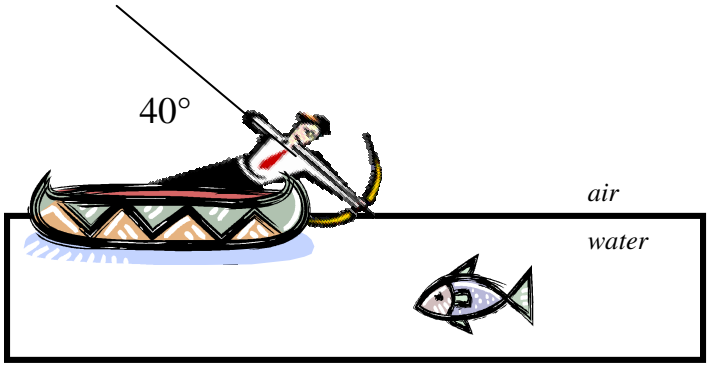


The following questions are from the lab we did in class. If you don't remember (or didn't pay attention), you can either come in and do it, again, OR use the lens applet on the internet.

11. A) Mark p and q on the above diagram.
    B) If the light bulb moves to the left, does p increase or decrease?
    C) To get the image to get bigger, which direction do you move the object: right or left?
    D) If p decreases, q will increase or decrease?
    E) Just by looking at the diagram, mark f and C on both sides (they don't have to be perfect, just in the right area).
    F) To make the image very small, where is the object: inside f, at f, between f and C, at C, outside C?
    G) What is the easy way I showed you to find the approximate location of f.

12. Draw the ray diagram for the following _____ lens.





To assuage his hunger, a well-dressed and rather hungry fisherman decides to go fishing. Fortunately for the fish, the well-dressed fisherman has only a bow and arrow and did not take physics. In his optical ignorance he thinks that the fish is right where he sees it.

13. A) The fish is actually in a different position due to what light phenomenon?

    B) Draw where the fish may really be (approximately).

    C) What angle do we need to use for our equations?

    D) You know the indexes of refraction for air and water, so calculate the angle that the light will travels in water.