A-day: Due Wed., Mar 25
B-day: Due Thurs., Mar 26

2009 Light 8

Name: _____

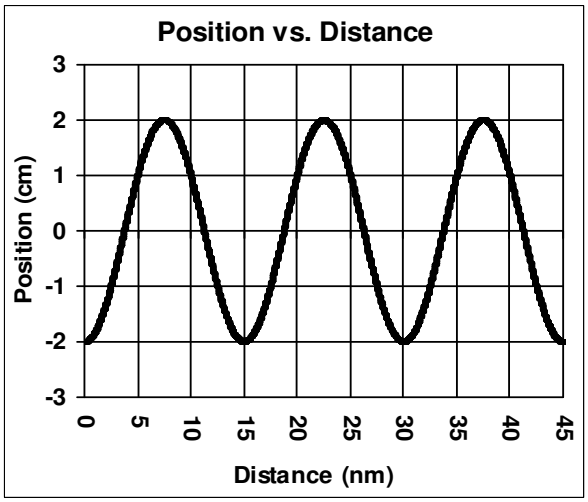
1. A satellite is surveying an asteroid. It takes its radio signals 3 minutes to reach the earth.
   A. How fast are the radio waves traveling?
   B. How far away is the satellite?

Remember that "Mega" means "million" (or $x10^6$) and "Nano" means $x\ 10^{-9}$ (500 nm = 500 $x10^{-9}$m)

2. Find the frequency of 620 nm light.

3. X-rays have these characteristics: $1.5x10^9$ Hz and 20 cm long.
   A. What is $1.5x10^9$ Hz?
   B. What is 20 cm?
   C. Calculate the speed of the x-rays.

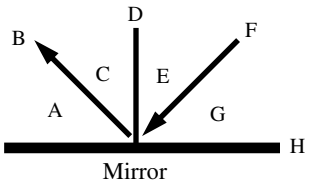
4. As the wavelength of light gets longer, does the frequency get bigger or smaller?



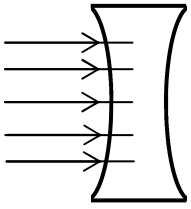
5. Use the graph to answer the following:
   A. What is the wavelength of the light wave?
   B. How many wavelengths are shown?
   C. Using the information at the bottom of "Light" notes: what part of the electromagnetic spectrum is this?
   D. What is the amplitude of the wave?
   E. What is the speed of the wave?
   F. Calculate the frequency of the wave (*remember what nanometers are*).

From "Optic Basics"

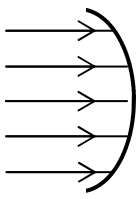
6. Use the diagram at the right to answer the following.
   A. Angle of incidence.
   B. Angle of reflection.
   C. The normal.
   D. How do the angle of incidence and the angle of reflection compare?



7. Draw what will happen to the parallel rays for each device and answer the questions.

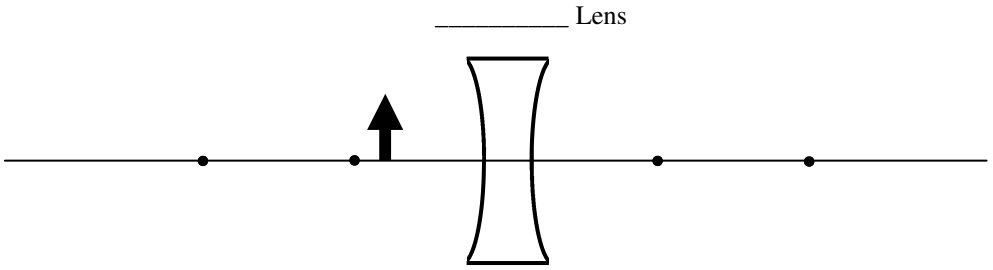


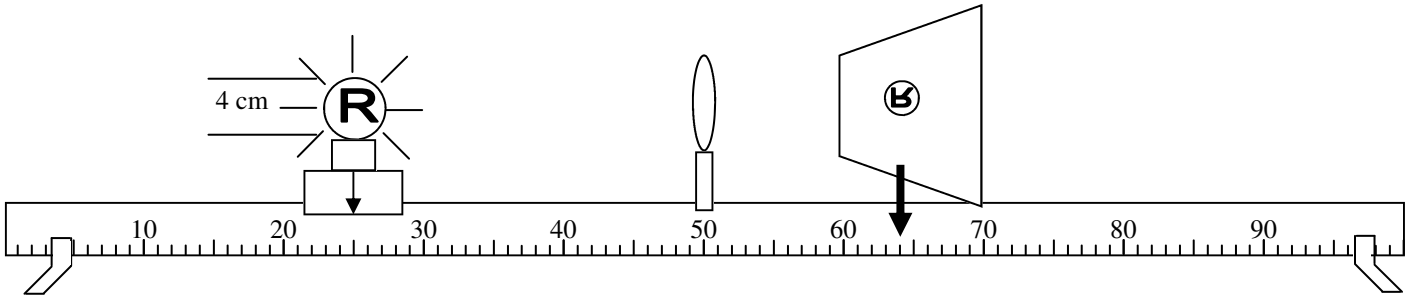
A. Convergent or Divergent?
B. Real or virtual focal point?
C. f is + or −?
D. Does light go thru or reflect back?
E. Which side is real?



A. Convergent or Divergent?
B. Real or virtual focal point?
C. f is + or −?
D. Does light go thru or reflect back?
E. Which side is real?

8. A. What kind of device?
   B. Convergent or divergent?
   C. Real or virtual focal point?
   D. Draw the ray diagram.
   E. Is the image magnified or reduced?
   F. Is the image real or virtual?

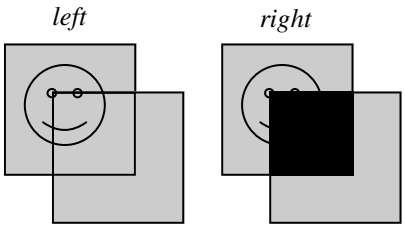




9. A. Mark p, q, h, and h' on the diagram above.
   B. Give three reasons why the image is real.

   C. Calculate the focal length.

   D. Calculate the height of the image.



10. Two polarizers are placed over a happy face at the right. In which situation is one of the polarizers turned 90°?

11. A. What kind of light is more efficient: incandescent or fluorescent light?
    B. Why?

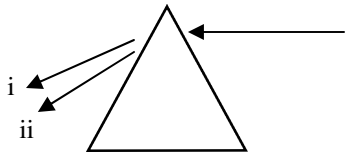
    C. If I wanted to use a light bulb to keep me warm. Which type should I choose?

12. A. Which color light made the shadow on the phosphorus pad brightest?
    B. Why?

    C. Even though used different color light to energize the pad, what color did the pad give off?
    D. Why?

13. Where does light come from?

14. A. What do we call it when white light separates in a prism?
    B. Which color bends more: blue or red?
    C. Which ray is blue: i or ii?



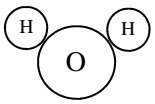
TAKS next page

The notes you need for this page were given out already. There are copies on the website, too.

From the "Water the (Nearly) Universal Solvent":

15. What is a polar molecule?

16. Label the + and − sides of the water molecule.



17. Why do the electrons tend to spend more time around oxygen?

18. What is cohesion?

19. What is dissociation?

20. Why is water called the (nearly) universal solvent?

21. Give three ways to speed up the dissolving rate of a substance.

22. Which dissolves faster:
    A. Powdered sugar or granulated sugar?
    B. In hot water or in cold water?
    C. Stirred or not stirred?
    D. Large particles or small particles?

23. A. Which holds more solid solute: hot or cold liquids?
    B. Why?

24. A. Which holds more gaseous solute: hot or cold solvents?
    B. Why?

From the "Solubility Graph" notes:

25. Are all of these substances in the water at the same time?
26. Below the line is the solution saturated, unsaturated, or supersaturated?
27. At 25°C, how much KBr can be dissolved?
28. Does temperature have more effect on KNO_3 or KBr?
29. At what temperature does KNO_3 and KBr have the same saturation point?
30. On which compound does temperature have the most effect?
31. On which compound does temperature have very little effect?
32. At what temperature does 120 g of $NaClO_3$ dissolve?
33. For NaCl at 60°C…
    A. How much is saturated?
    B. Is 50 g saturated, unsaturated, or supersaturated?
34. For KBr at 80°C is 70 g saturated, unsaturated, or supersaturated?
35. Challenge: At 75°C how much KNO_3 can be dissolved in 350 g of water?