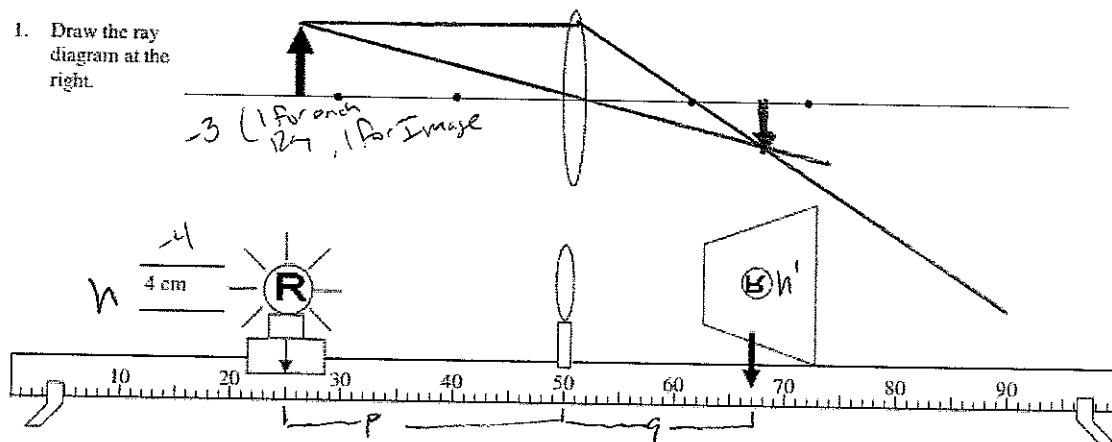


# Homework 7

Name: \_\_\_\_\_

1. Draw the ray diagram at the right.



2. Label p, q, h, and h' on the diagram above.

- B. Is the image real or virtual? **-1**  
 C. Is the image magnified or reduced? **-1**  
 D. Will the value of (the number for) M be + or -? **-1**  
 E. Is the image on the real or virtual side of the lens? **-1**  
 F. Calculate the focal length.

$$\frac{1}{p} + \frac{1}{q} = \frac{1}{f}$$

$$M = \frac{h'}{h} = -\frac{q}{p}$$

$$\frac{1}{25} + \frac{1}{67} = \frac{1}{f} \quad .0988 = \frac{1}{f} \quad f = 10.1 \text{ cm} \quad -2$$

- G. What is the radius of curvature for this lens? **20.2 cm**. Label f and C on the diagram on both sides.

- I. Calculate the magnification.

- J. Calculate the height of the image.

$$M = \frac{-q}{p} = \frac{-67}{25} = -2.68 \quad -2$$

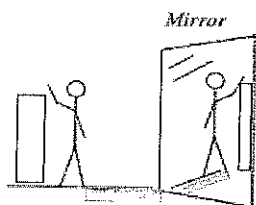
$$M = \frac{h'}{h} \quad -2.68 = \frac{h'}{4 \text{ cm}} \quad h' = -10.72 \text{ cm} \quad -2$$

- K. To make the image smaller, which way would you move the object?

**Away from lens -1**



3. What three lights make up white light? **RGB -1**  
 4. A. What light is reflected off the magenta (draw it)? **RB -1** B. So what color does magenta absorb? **G -1**  
 5. A. What color or colors does yellow reflect? **RG -1** B. What color does yellow absorb? **B -1**  
 6. So, if magenta and yellow paints are mixed,  
 A. What two colors are absorbed? **GB -1** B. What color is reflected? **R -1**  
 7. Given red, green, and blue lights, which ones make yellow? **RG -1**  
 8. What is the focal point of a lens? **Where light rays cross -1**

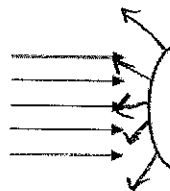
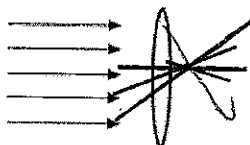
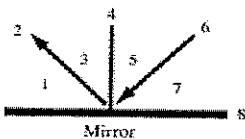


9. Slim Jim is standing in front of a flat mirror and has a meter stick between him and the mirror (he is one meter in front of the mirror).

- A. How far inside the mirror is his image? **1m -1**  
 B. How far is Jim from his image? **2m -1**

10. X-rays have these characteristics:  $1.5 \times 10^8$  Hz and 20 cm long.

- A. What is  $1.5 \times 10^8$  Hz?  
 B. What is 20 cm?  
 C. Calculate the speed of the x-rays.



11. From the diagram above:  
 A. The angle of incidence is: **6 -1**  
 B. The angle of reflection is: **2 -1**  
 C. The normal is: **4 -1**  
 D. How do the angle of incidence and the angle of reflection compare?  
**always = -1**

12. A. **Convergent or divergent?** **-1**  
 B. **Concave or convex?** **-1**  
 C. **Mirror or lens?** **-1**  
 D. Draw what happens to the rays.

13. A. **Convergent or divergent?** **-1**  
 B. **Concave or convex?** **-1**  
 C. **Mirror or lens?** **-1**  
 D. Draw what happens to the rays.