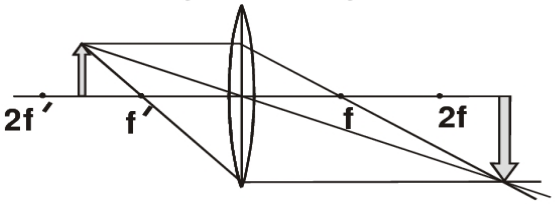
AP Physics – Light Reflection Be On Thee – 3A ANs

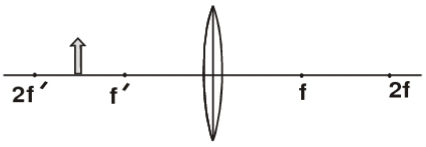
1. You are wearing a blue shirt, you look in a mirror at yourself [you're so vain!] and your image is also wearing a blue shirt. What does this tell you about the frequency of light incident upon the mirror compared to its frequency when reflected?

2. What is the speed of light in a block of transparent ice?

$$n = \frac{c}{v} \quad v = \frac{c}{n} \quad = \frac{\left(3 \times 10^8 \frac{m}{s}\right)}{1.309} \quad = \boxed{2.29 \times 10^8 \frac{m}{s}}$$

3. Locate the image in the drawing:

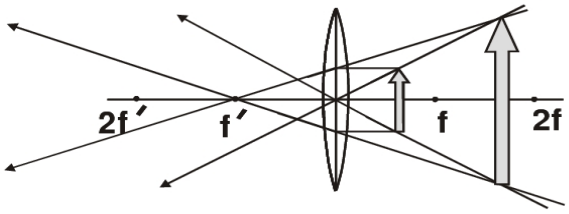


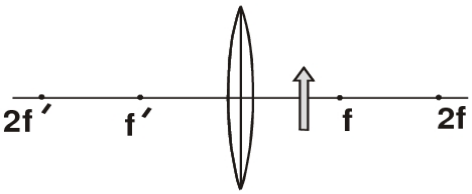


4. A converging lens has a focal length of 22.5 cm. If the object is 62.0 cm from the optical center, what is the image distance? What is the magnification and what is the image height if the object is 3.50 cm in height?

$$\frac{1}{s_i} + \frac{1}{s_o} = \frac{1}{f} \qquad \frac{1}{s_i} = \frac{1}{f} - \frac{1}{s_o} \quad = \frac{1}{22.5\,\text{cm}} - \frac{1}{62.0\,\text{cm}} \quad s_i = \boxed{35.3\,\text{cm}}$$

5. Make a ray diagram showing how the image forms in the drawing:





6. Camera lenses are described in terms of their focal lengths. A typical 35 mm (the size of the film) camera has a 50.0 mm lens. This means that the focal length of the lens is 50.0 mm. If the camera is focused on an object that is 3.00 m away, what is the image distance?