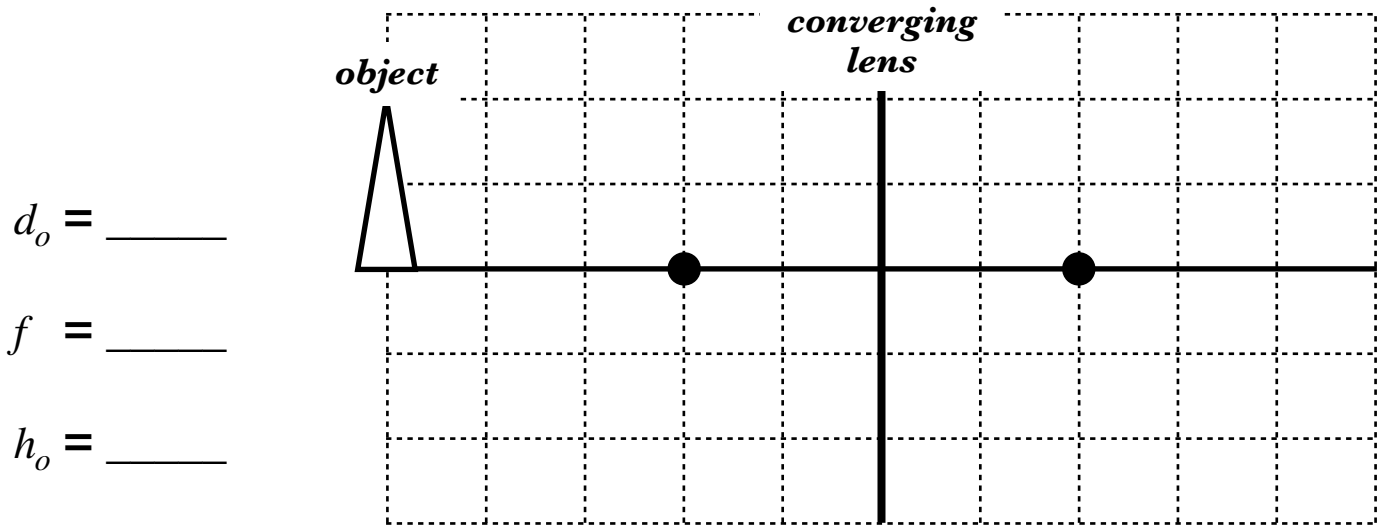


# Physics 102 Homework #6

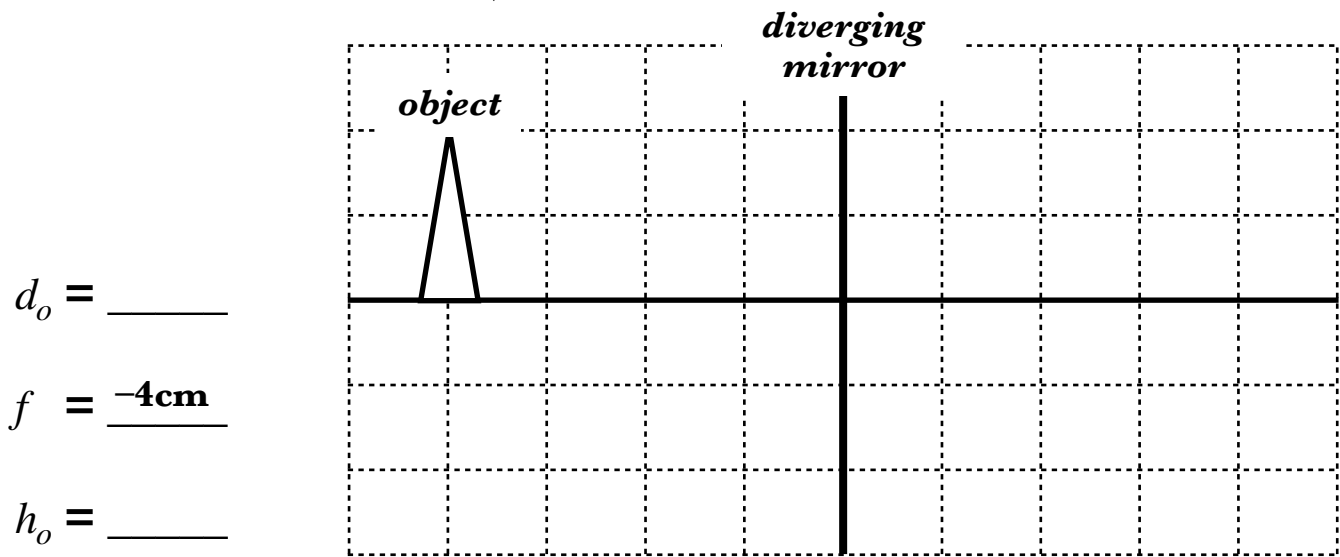
*first draft due Wednesday, March 8th  
final draft due Sunday, March 12th*

1. The figure shows a converging lens with a focal length of 2cm. An object is 5cm to the left of the lens and is 2cm tall.



- a. Fill in the blanks above, and use the lens equation to find  $d_i$ , the image-to-lens distance.
- b. Find the magnification of the image.
- c. Find the height  $h_i$  of the image.
- d. Is this a real or a virtual image?
- e. Draw the image above at the correct location and with the correct size & orientation.

2. The figure shows a diverging mirror with a focal length of  $-4\text{cm}$ . An object is  $4\text{cm}$  to the left of the mirror and is  $2\text{cm}$  tall.



- a. a. Fill in the blanks above, and find  $d_i$ , the image-to-lens distance.

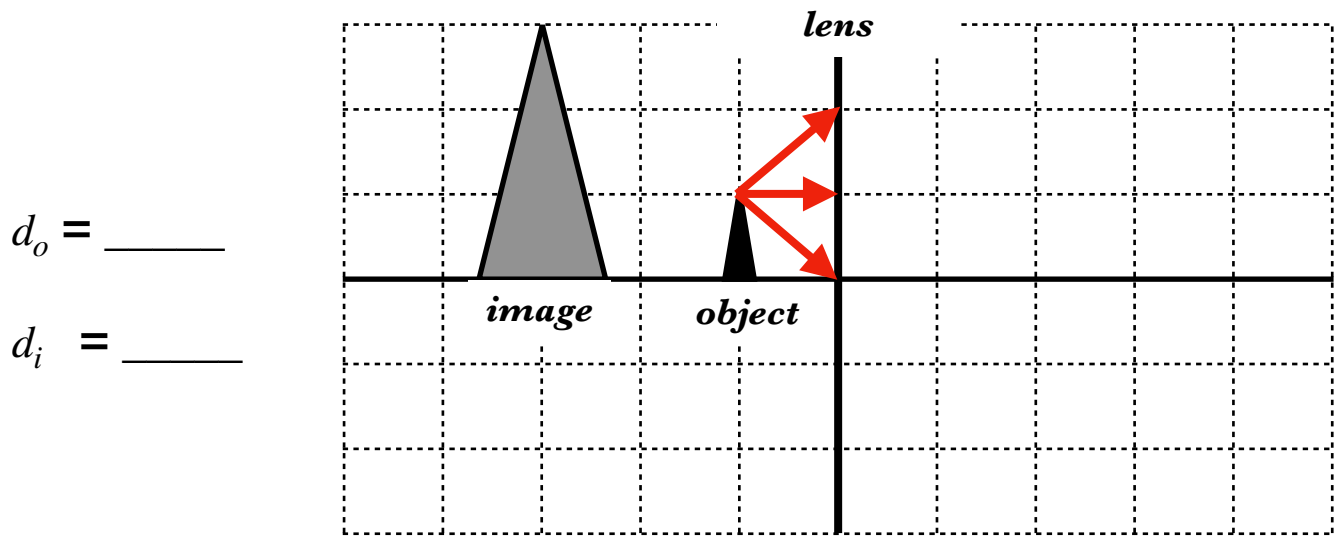
- b. Find the magnification of the image.

- c. Find the height  $h_i$  of the image.

- d. Draw the focal point(s) of this mirror on the picture above.

- e. Draw the image above at the correct location and with the correct size & orientation.

3. The figure shows an object and the image created by a lens. The grid lines are 1 cm apart.



- a. Fill in the blanks above, and find the focal length  $f$  of the lens.

b. Is the image real or virtual?

c. Is this a converging or diverging lens?

d. I've drawn three rays that are emitted from the top of the object and hit the lens. Please draw what the rays do after they pass through the lens, and please use a straightedge.

4. A projector has a 0.010m tall LCD display, which is projected onto a screen by its lens. The display is 0.005 m behind the lens, and the image on the screen is 4 meters tall.



a. What is the magnification of the image? (*Be careful of units.*)

b. Use the magnification to find the distance from the screen to the lens