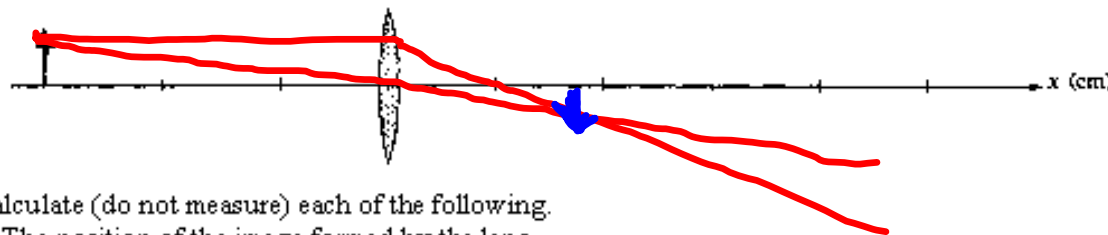


1992B6. A thin double convex lens of focal length $f = +15$ centimeters is located at the origin of the x -axis, as shown above. An object of height 8 centimeters is placed 45 centimeters to the left of the lens.

- a. On the figure below, draw a ray diagram to show the formation of the image by the lens. Clearly show principal rays.



- b. Calculate (do not measure) each of the following.
 i. The position of the image formed by the lens
 ii. The size of the image formed by the lens
 c. Describe briefly what would happen to the image formed by the lens if the top half of the lens were blocked so that no light could pass through.

$$M = -\frac{22.5}{45} = -\frac{d_i}{d_o}$$

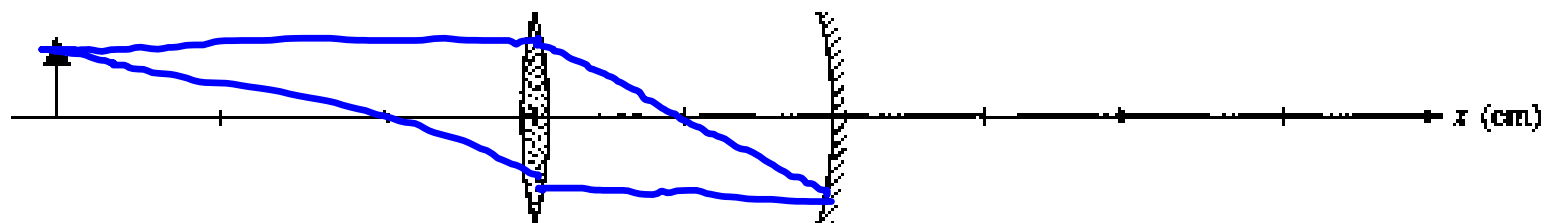
DIMMER
 is only
 difference

$$\frac{1}{15\text{cm}} = \frac{1}{45} + \frac{1}{d_i}$$

$$d_i = 22.5\text{cm}$$

A concave mirror with focal length $f_2 = +15$ centimeters is placed at $x = +30$ centimeters.

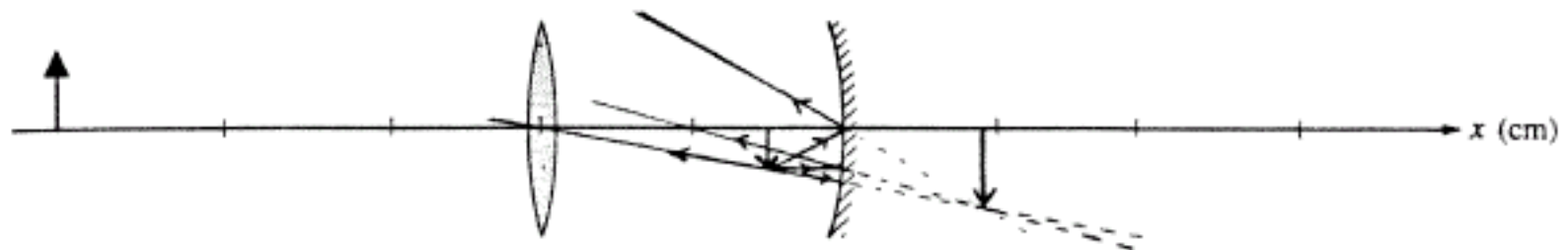
- d. On the figure below, indicate the position of the image formed by the lens, and draw a ray diagram to show the formation of the image by the mirror. Clearly show principal rays.



6. (continued)

or points

(d) 3 points



One point each for up to two correct principal rays

2 points

For correct location and orientation of image (consistent with rays drawn)

1 point

