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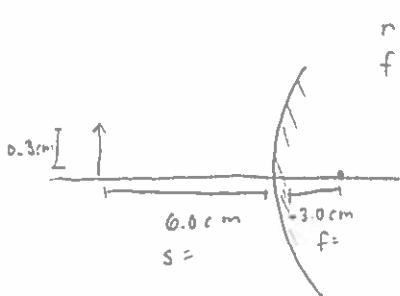
Homework Quiz #6 Version D

1. [You may use the space below and the back of this sheet.]

An object 0.3 cm tall is placed 6.0 cm to the left of the vertex of a convex spherical mirror having a radius of curvature of -6.0 cm. (Hint: we denote distances on the shiny side of the mirror as positive and on non-shiny side of the mirror as negative. So a convex mirror has a negative radius of curvature.)

- a) Calculate the position of the image.
- b) Calculate the size of the image.
- c) Is the orientation of the image "erect" or "inverted"?
- d) Is the nature of the image "real" or "virtual"?

e) Draw a "principle ray diagram" showing at least two principle rays. Indicate the location and distance of the focal point, image, and object (with our sign convention.) Don't bother writing units—just use numbers that are in cm. [Hint: For ease of drawing, the vertical and horizontal sizes may not be to scale.]



$r = -6.0 \text{ cm}$
 $f = -3.0 \text{ cm}$

(a) $\frac{1}{f} = \frac{1}{s'} + \frac{1}{s}$

$\frac{1}{f} - \frac{1}{s} = \frac{1}{s'}$

$(-\frac{2}{6} - \frac{1}{6})$

$(\frac{1}{f} - \frac{1}{s})^{-1} = s'$

$(-\frac{1}{3} - \frac{1}{6})^{-1} = s'$

$= (-\frac{2}{6} - \frac{1}{6})$

$s' = (-\frac{1}{2})$

$s' = -2.0 \text{ cm}$ (or 2cm to right of vertex)

(b) $\frac{h'}{h} = (-\frac{s'}{s})$

$h' = h(-\frac{s'}{s})$

$= (0.3)(\frac{+2.0 \text{ cm}}{6.0 \text{ cm}}) = (0.3)(\frac{1}{3}) =$

height = 0.10 cm

(c) Erect

(d) virtual image

