name_____

ID# _____

Experiment 7

The Focal Length of a Curved Mirror

Distant Object

Position of mirror _____ **Position of image** _____

f = _____ **R =** _____

Characterize the image:

Nearby Object ($d_o > R$)

Position of object _____ **Object size (h_o)** _____

Position of mirror _____ **Image size (h_i)** _____

Position of image _____

Characterize the image:

Nearby Object ($R > d_o > f$)

Position of object _____ **Object size (h_o)** _____

Position of mirror _____ **Image size (h_i)** _____

Position of image _____

Characterize the image:

Parallax Method for Diverging Mirror

Position of object rod _____

Position of mirror _____

Position of image rod _____

Characterize the image:

Analysis

Distant Object

f = _____ **R =** _____

Nearby Object ($d_o > R$)

d_o = _____ d_i = _____

f = _____

$\frac{h_i}{h_o}$ = _____ $\frac{-d_i}{d_o}$ = _____

% difference between focal lengths = _____

% difference between magnifications = _____

Nearby Object ($R > d_o > f$)

d_o = _____ d_i = _____

f = _____

$\frac{h_i}{h_o}$ = _____ $\frac{-d_i}{d_o}$ = _____

% difference between focal lengths = _____

% difference between magnifications = _____

Diverging Mirror

d_o = _____ d_i = _____

f = _____

(10 points)

What is the relationship between the object distance and the image distance for a converging mirror? A diverging mirror? What happens to the image distance for each as the object distance gets smaller? What happens to the magnification for each?

Questions

1. How did the image produced by the diverging mirror differ from that produced by the converging mirror? What sign convention must be used with h_i if the magnification equations are to give consistent results? **(3 points)**

2. The radius of curvature for a plane mirror is infinite. This means that $\frac{1}{f}$ equals zero. What must be true about d_o and d_i if the mirror equation is to be true for flat mirrors? Where must the image always be? What must its magnification be? **(3 points)**

3. The passenger side rear view mirrors on many cars are diverging rather than plane mirrors. What is the advantage of using a diverging mirror? What is a disadvantage? **(4 points)**