PhyzGuide: Mirror Measures & Eqns

REAL SIDE OF MIRROR
focal length, object distance, and image distance are **positive** in front of the mirror

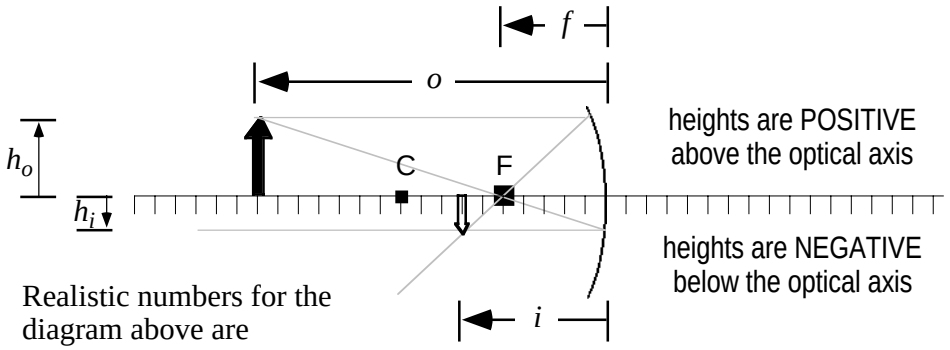
VIRTUAL SIDE OF MIRROR
focal length and image distance are **negative** behind the mirror

A. CONVERGING MIRRORS (aka concave, positive mirrors)

FOR ALL MIRRORS

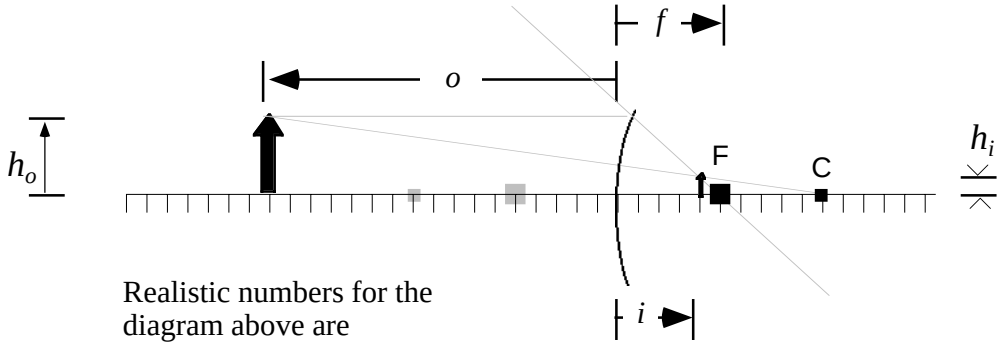
PLACES
F = focal point
C = center

DISTANCES
f = focal length = $r/2$
r = center length = $2f$
o = object distance
i = image distance
h_o = object height
h_i = image height



Realistic numbers for the diagram above are
f = +5.0cm r = +10.0cm
o = +17.0cm i = +7.1cm
h_o = +4.0cm h_i = –1.7cm

B. DIVERGING MIRRORS (aka convex, negative mirrors)



Realistic numbers for the diagram above are
f = –5.0cm r = –10.0cm
o = +17.0cm i = –3.9cm
h_o = +4.0cm h_i = +0.9cm

IMPORTANT MIRROR EQUATIONS

Image distance, **object** distance and **focal** distance are related by the equation.....

$$\frac{1}{f} = \frac{1}{o} + \frac{1}{i}$$

The **image height** is related to the **object height** by this expression. The negative sign indicates whether or not the image will be erect or inverted.....

$$\frac{h_i}{h_o} = \frac{-i}{o}$$

The **magnification** factor of a mirror is defined as.....

$$m = \frac{h_i}{h_o} = \frac{-i}{o}$$

db