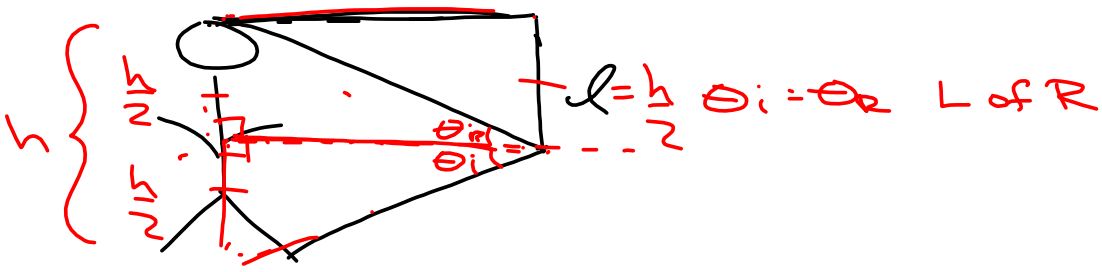
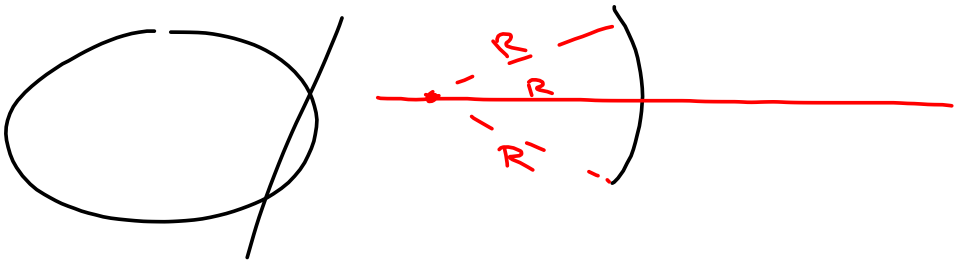
Yesterday's Mirror Question



Spherical Mirrors

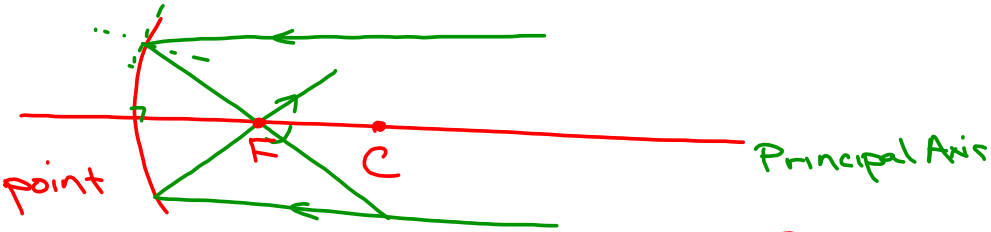


Concave Convex

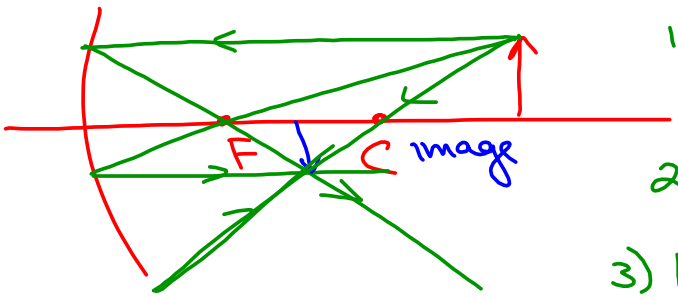
C = center of curvature

F = focal point

f = focal length



$f = \frac{R}{2}$



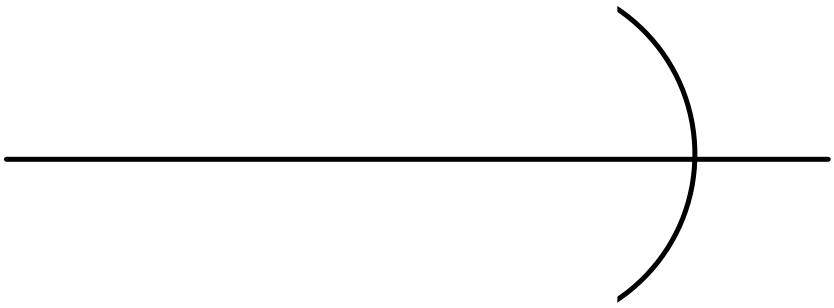
1) In ll out through F

2) In through F out ll to P.A

3) In through C out through C

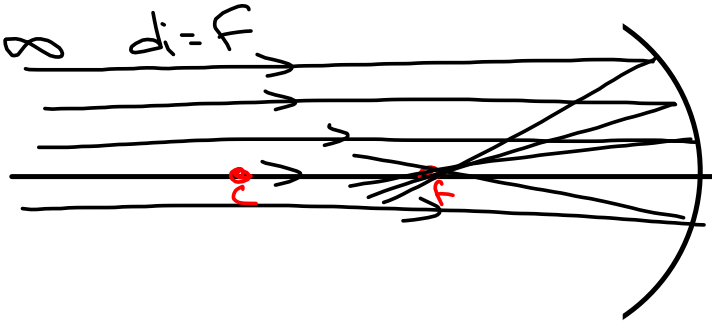
Day 2: Spherical Mirrors

Concave Mirrors



Cases:

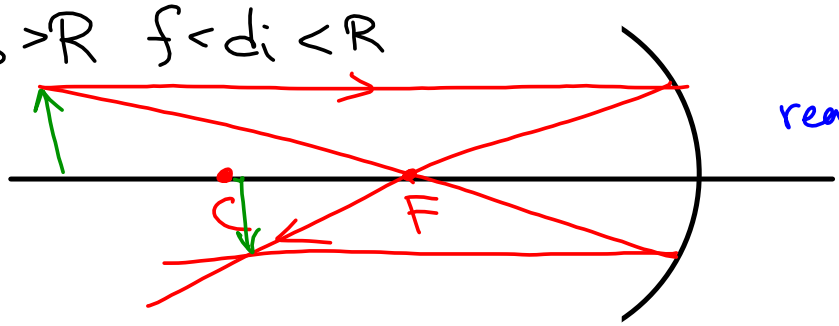
1) $d_o = \infty$ $d_i = f$



point image
$d_i = f$
inverted, smaller
real

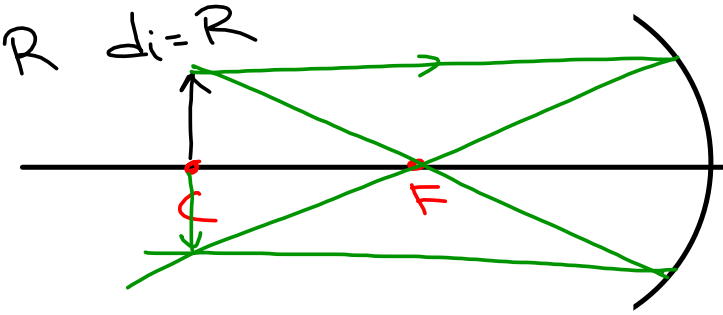
rays of light converge to a point

2) $d_o > R$ $f < d_i < R$



real, inverted
smaller

3) $d_o = R$ $d_i = R$

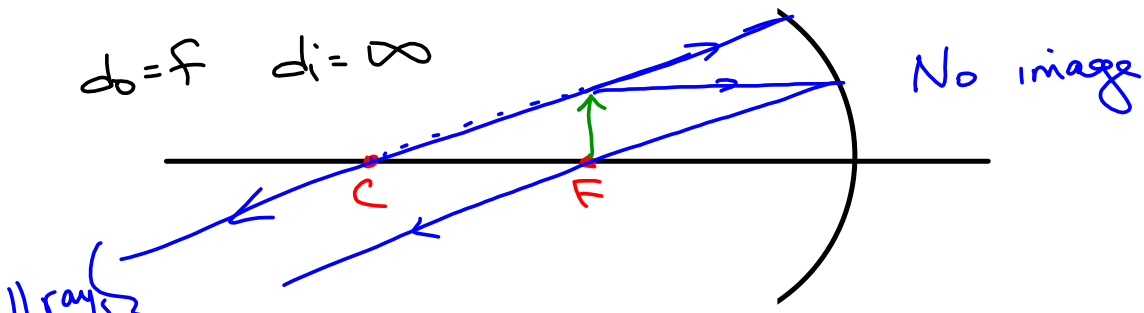


real
inverted
same size

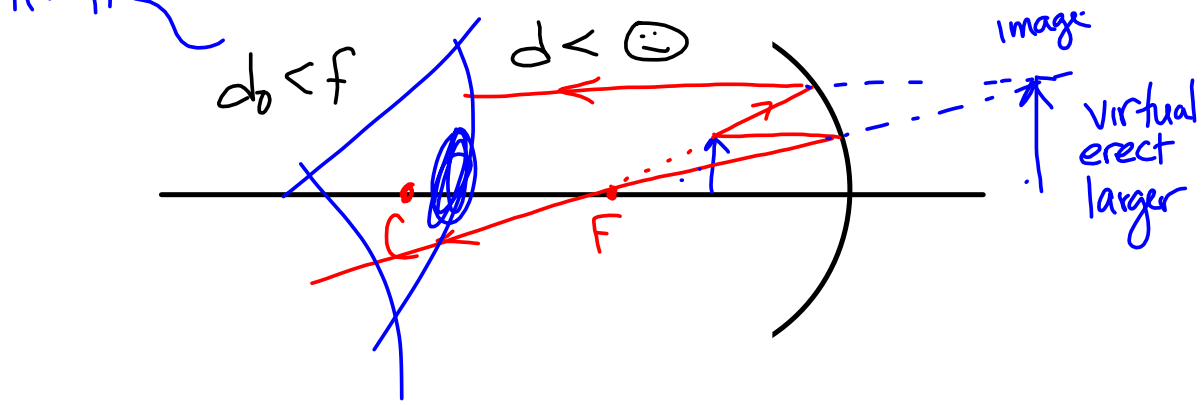
4) $f < d_o < R$ $d_i > R$

real
inverted
larger

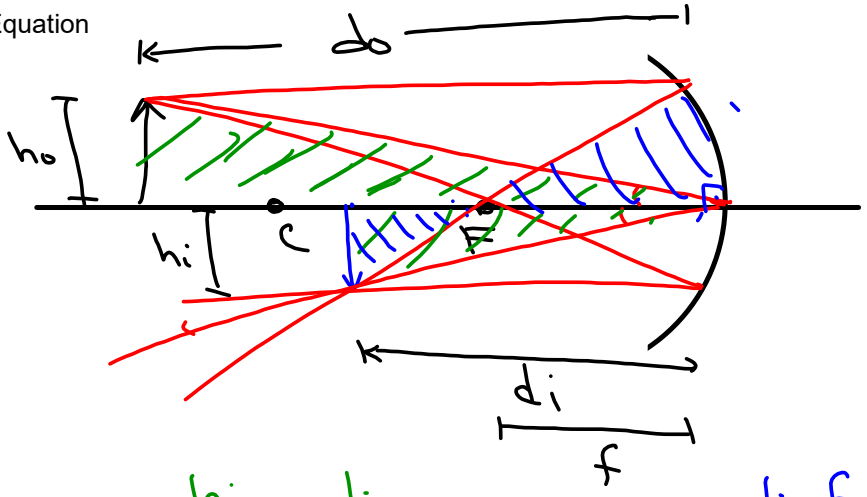
5)


$d_o = f$ $d_i = \infty$
No image
C
F
|| rays

6)


$d_o < f$
$d <$ ☹
image
virtual
erect
larger
C
F

The Mirror Equation



$$\frac{h_i}{h_o} = \frac{d_i}{d_o} \qquad \frac{h_i}{h_o} = \frac{d_i - f}{f}$$

$$\frac{d_i}{d_o} = \frac{d_i - f}{f}$$

$$d_i f = d_o d_i - d_o f$$

$$\frac{d_o d_i}{d_o d_i f} = \frac{d_i f + d_o f}{d_o d_i f}$$

Mirror (and lens!) equation

$$\boxed{\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}}$$

$1/x \quad x^{-1}$

10^x

E
EE

EXP
x10^x

$f = 0.10\ m \qquad d_o = 1.5 \times 10^{11}\ m$

Magnification

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

↑ to match convention

Convex Mirrors