

# LENS & MIRROR SIGN CONVENTIONS:

## THIN LENS EQUATION / MIRROR EQUATION

$$\frac{1}{d_1} + \frac{1}{d_2} = \frac{1}{f}$$

f POSITIVE: LENS CONVERGING ( )  
MIRROR CONCAVE ( )

f NEGATIVE: LENS DIVERGING ( X )  
MIRROR CONVEX ( )

IF  $d_1$  POSITIVE:

•  $d_2$  POSITIVE MEANS:

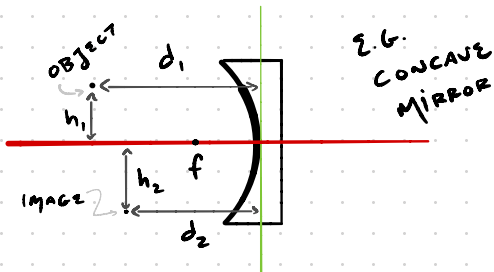
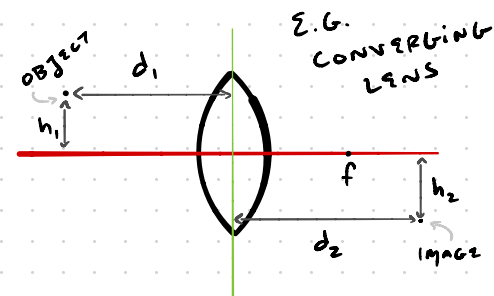
LENS: IMAGE & OBJECT ON OPPOSITE SIDES OF LENS

MIRROR: IMAGE & OBJECT ON SAME SIDE OF MIRROR

•  $d_2$  NEGATIVE MEANS:

LENS: IMAGE & OBJECT ON SAME SIDE OF LENS

MIRROR: IMAGE & OBJECT ON OPPOSITE SIDES OF MIRROR



IF  $h_1$  POSITIVE:

•  $h_2$  POSITIVE MEANS:

• IMAGE & OBJECT ON SAME SIDE OF LENS / MIRROR AXIS

•  $h_2$  NEGATIVE MEANS:

• IMAGE & OBJECT ON OPPOSITE SIDES OF LENS / MIRROR AXIS

MAGNIFICATION EQUATION:

$$\frac{h_2}{h_1} = -\frac{d_2}{d_1}$$

## CHECK FOR UNDERSTANDING:

a) • WHEN  $d_2$  IS POSITIVE, IS:

•  $h_2$  POSITIVE OR NEGATIVE?

• THE IMAGE UPRIGHT OR INVERTED?

• THE IMAGE REAL OR VIRTUAL?  
(USE RAY TRACING)

- ARE YOUR ANSWERS THE SAME FOR BOTH  
MIRRORS + LENSES?

b) • SAME QUESTION, EXCEPT  $d_2$  IS NEGATIVE.