

Sign Conventions

Mirrors

p = object distance	+	object in front of the mirror
q = image distance	+	image in front of the mirror – REAL
	-	Image behind the mirror – VIRTUAL
h = object height } h' = image height }	+	points up – upright
	-	points down – inverted
M = magnification	+	upright
	-	inverted
$M = \frac{h'}{h} = \frac{-q}{p}$		
f = focal length	+	concave/converging
	-	convex/diverging
Mirror Equation:	$\frac{1}{p} + \frac{1}{q} = \frac{1}{f} = \frac{2}{R}$	

Lenses

p = object distance	+	object in front of the lens
	-	object behind the lens
q = image distance	+	image behind the lens – REAL
	-	Image in front of the lens – VIRTUAL
h = object height } h' = image height }	+	points up – upright
	-	points down – inverted
M = magnification	+	upright
	-	inverted
$M = \frac{h'}{h} = \frac{-q}{p}$		
R_1 & R_2 } R_1 & R_2 } Radii of curvature for the front and back surfaces respectively	+	in back
	-	in front
f = focal length	+	converging
	-	diverging
Thin Lens Equation:	$\frac{1}{p} + \frac{1}{q} = \frac{1}{f}$	
Lens Maker's Equation:	$P = \frac{1}{f} = (n - 1) \left(\frac{1}{R_1} - \frac{1}{R_2} \right)$	