Equations Table:

$c = f\lambda \quad v = f\lambda_n$

$n \equiv \frac{c}{v} = \frac{\lambda}{\lambda_n}$

$\theta_1^{'} = \theta_1$

$n_1 \sin\theta_1 = n_2 \sin\theta_2$

$\sin\theta_c = \frac{n_2}{n_1} \quad , n_1 > n_2$

$M = \frac{y'}{y} = -\frac{s'}{s}$

$\frac{1}{s} + \frac{1}{s'} = \frac{2}{R} = \frac{1}{f}$

---

sign conventions

$s \rightarrow \begin{cases} + \text{ if obj is on the side of the incoming light} \\ - \text{ otherwise} \end{cases}$

$s' \rightarrow \begin{cases} + \text{ if img is on the side of the outgoing light} \\ - \text{ otherwise} \end{cases}$

$y, y' \rightarrow \begin{cases} + \text{ if object or img is upright} \\ - \text{ if object or img is inverted} \end{cases}$

$f, R \rightarrow \begin{cases} + \text{ if cent. of curv. is on the side of the outgoing light} \\ - \text{ otherwise} \end{cases}$

$\frac{n_a}{s} + \frac{n_b}{s'} = \frac{n_b - n_a}{R}$

$\frac{1}{s} + \frac{1}{s'} = (n-1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right) = \frac{1}{f}$

$f \rightarrow \begin{cases} + \text{ if lens is converging} \\ - \text{ if lens is diverging} \end{cases}$

$d \sin\theta = m\lambda$

$d \sin\theta = (m + 1/2)\lambda$

$I = I_{\max} \cos^2\left(\frac{\pi d \sin\theta}{\lambda}\right)$

$2nt = (m + 1/2)\lambda$

$2nt = m\lambda$

$\sin\theta = m\frac{\lambda}{a}$

$I = I_{\max}\left[\frac{\sin\beta/2}{\beta/2}\right]^2$

$\beta = (2\pi a \sin\theta)/\lambda$

$\theta_{\min} = 1.22\frac{\lambda}{a}$

$R = Nm$

$n = \tan\theta_p$

$I = I_{\max} \cos^2\theta$