

lens/mirror equation

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

magnification Eq

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

↙

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

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

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

↘

$$\frac{1}{d_i} = \frac{1}{f} - \frac{1}{d_o}$$

$$\frac{1}{d_i} = \frac{d_o}{f d_o} - \frac{f}{f d_o} = \frac{d_o - f}{f d_o}$$

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

$$\frac{1}{d_o} = \frac{1}{f} - \frac{1}{d_i}$$

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

magnification

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