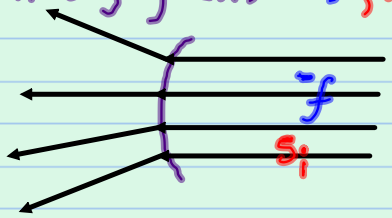
37) diverging lens $-f$, virtual $-s_i$



$\frac{1}{3}h_o = h_i$ $\quad s_o = ?$

$h_o = 3h_i$

$$\frac{h_i}{h_o} = \frac{-s_i}{s_o}$$

$$\frac{h_i}{3h_i} = \frac{-s_i}{s_o} \quad -3s_i = s_o \quad s_i = \frac{-s_o}{3}$$

$$\frac{1}{s_i} + \frac{1}{s_o} = \frac{1}{f}$$

$$\frac{1}{\frac{-s_o}{3}} + \frac{1}{s_o} = \frac{1}{f} \quad \left(\frac{-3}{s_o} + \frac{1}{s_o} = \frac{1}{f}\right)s_o$$

$$-3 + 1 = \frac{s_o}{f}$$

$$-2 = \frac{s_o}{f} \qquad \boxed{-2f = s_o}$$