

3.1

牛顿法: ① $x = 3f' \Rightarrow x' = \frac{f'}{3} \Rightarrow \beta = -\frac{x'}{f'} = -\frac{1}{3} \Rightarrow y' = |\beta y| = \frac{100}{3} \text{ mm}$
 ② $x = 2f' \Rightarrow x' = \frac{f'}{2} \Rightarrow \beta = -\frac{x'}{f'} = -\frac{1}{2} \Rightarrow y' = |\beta y| = 50 \text{ mm}$
 ③ $x = f' \Rightarrow x' = f' \Rightarrow \beta = -\frac{x'}{f'} = -1 \Rightarrow y' = |\beta y| = 100 \text{ mm}$
 ④ $x = \frac{f'}{2} \Rightarrow x' = 2f' \Rightarrow \beta = -\frac{x'}{f'} = -2 \Rightarrow y' = |\beta y| = 200 \text{ mm}$

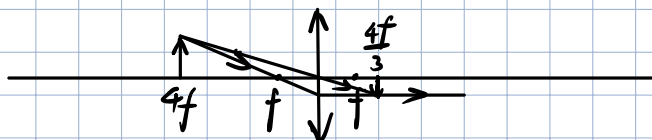
高斯公式: ① $\frac{1}{4f'} + \frac{1}{v} = \frac{1}{f'} \Rightarrow v = \frac{4f'}{3} \Rightarrow y' = \left| \frac{4f'}{3} \cdot \frac{y}{4f'} \right| = \frac{100}{3} \text{ mm}$

② $\frac{1}{3f'} + \frac{1}{v} = \frac{1}{f'} \Rightarrow v = \frac{3f'}{2} \Rightarrow y' = 50 \text{ mm}$

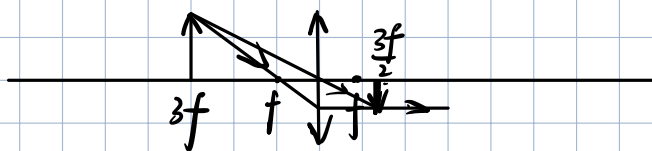
③ $\frac{1}{2f'} + \frac{1}{v} = \frac{1}{f'} \Rightarrow v = 2f' \Rightarrow y' = 100 \text{ mm}$

④ $\frac{2}{3f'} + \frac{1}{v} = \frac{1}{f'} \Rightarrow v = 3f' \Rightarrow y' = 200 \text{ mm}$

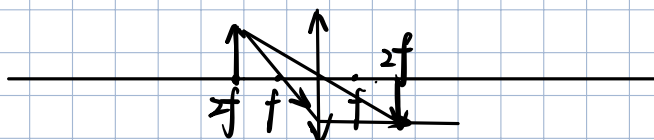
作图法: ①



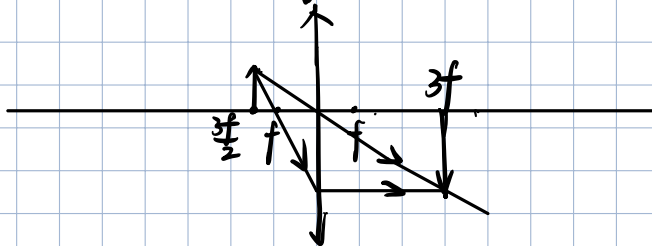
②



③



④



3.12

$$f = -\frac{f_1' f_2'}{\Delta} = 1200 \text{ mm}, \Delta = d - f_1' - f_2'$$

薄透镜: $\Rightarrow f' = f - f' - f$

$\frac{1}{d-f_1} + \frac{1}{L-d} = \frac{1}{f_2}$
 $L-d = L' = 40\text{mm}, L = 700\text{mm}$

$$\Rightarrow d = (700 - 40)\text{mm} = 660\text{mm}$$

$$\Rightarrow f_1 f_2 = -(660 - f_1 - f_2) \cdot 1200 (\text{mm})^2, \quad \frac{1}{660 - f_1} + \frac{1}{40} = \frac{1}{f_2}$$

$$\Rightarrow f_1 = 682.759\text{mm}, f_2 = -52.8\text{mm}, d = 660\text{mm}$$