

36. Refer to Fig. 35-17. For the intermediate image $p = 10 \text{ mm}$ and $i = (f_{\text{ob}} + s + f_{\text{ey}}) - f_{\text{ey}} = 300 \text{ mm} - 50 \text{ mm} = 250 \text{ mm}$, so

$$\frac{1}{f_{\text{ob}}} = \frac{1}{i} + \frac{1}{p} = \frac{1}{250 \text{ mm}} + \frac{1}{10 \text{ mm}} \implies f_{\text{ob}} = 9.62 \text{ mm} ,$$

and $s = (f_{\text{ob}} + s + f_{\text{ey}}) - f_{\text{ob}} - f_{\text{ey}} = 300 \text{ mm} - 9.62 \text{ mm} - 50 \text{ mm} = 240 \text{ mm}$. Then from Eq. 35-14,

$$M = -\frac{s}{f_{\text{ob}}} \frac{25 \text{ cm}}{f_{\text{ey}}} = -\left(\frac{240 \text{ mm}}{9.62 \text{ mm}}\right) \left(\frac{150 \text{ mm}}{50 \text{ mm}}\right) = -125 .$$