

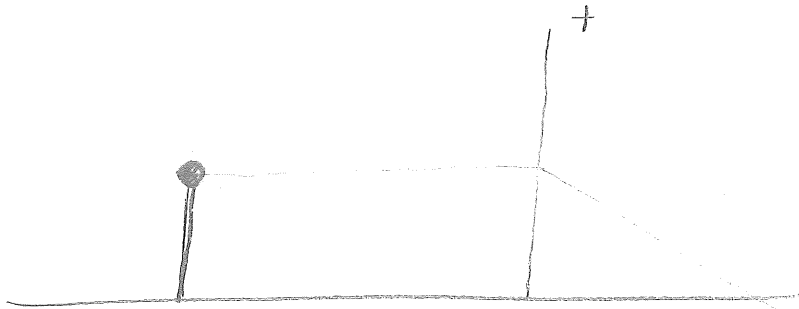
3.1

skillnaden i brytningsindex
minskar, \rightarrow brytningen minskar
 \rightarrow vinkelförstoringen minskar.

3.2

Nej, vi vill även ha hög
dispersion.

3.3



Bilden är upp-

och ner \rightarrow positiv lins

3.4

$$a) L = \frac{1}{2}(f_1 + f_2), \frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2} + \frac{L}{f_1 f_2}$$

$$M = \frac{25}{f[\text{cm}]}$$

b)

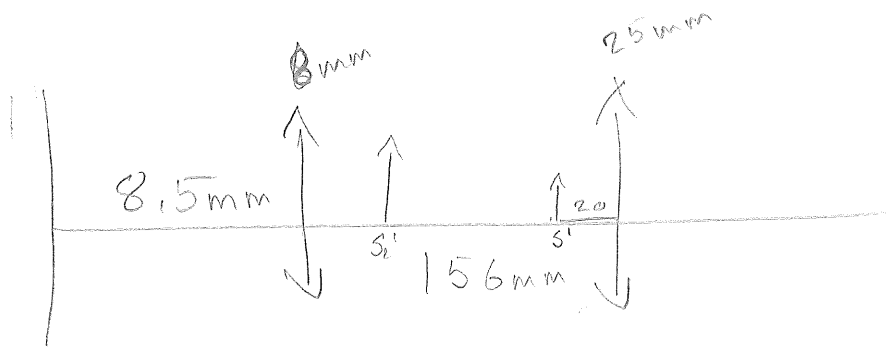
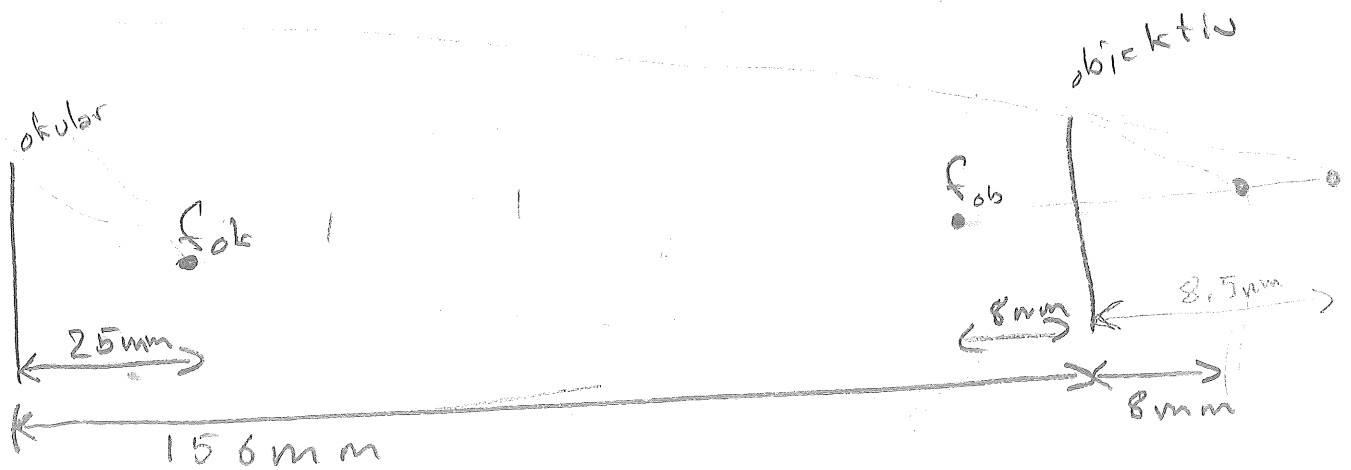
3.5

Objektivlinse: $f_{ob} = 8.00 \text{ mm}$

$d_{ob} = 9.80 \text{ mm}$

Okularlinse: $f_{ok} = 25.0 \text{ mm}$

$d_{ok} = ?$

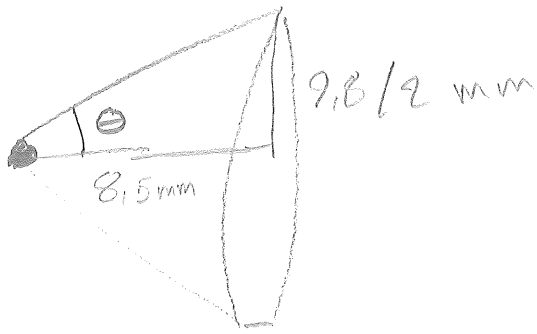


$$\frac{1}{8} = \frac{1}{8.5} + \frac{1}{s'} \Rightarrow s' = 136 \text{ mm}$$

$$\frac{1}{25} = \frac{1}{20} + \frac{1}{s_2'} \Rightarrow s_2' = -100$$

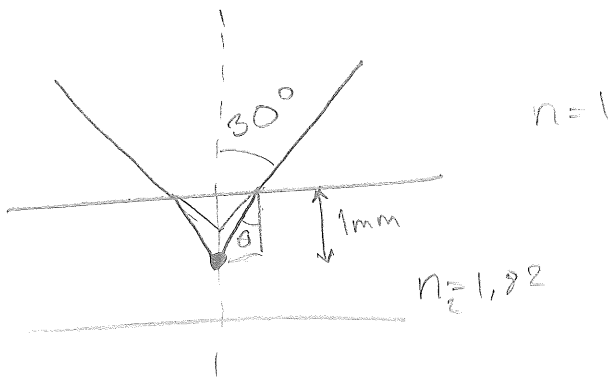
$$a) m_1 = \frac{s'}{s} = 16 \quad m_2 = \frac{s_2'}{s_1'} = 5 \Rightarrow \boxed{m_1 \cdot m_2 = -80}$$

b)



$$\theta = \arctan\left(\frac{9.8/2}{8.5}\right) = 30^\circ$$

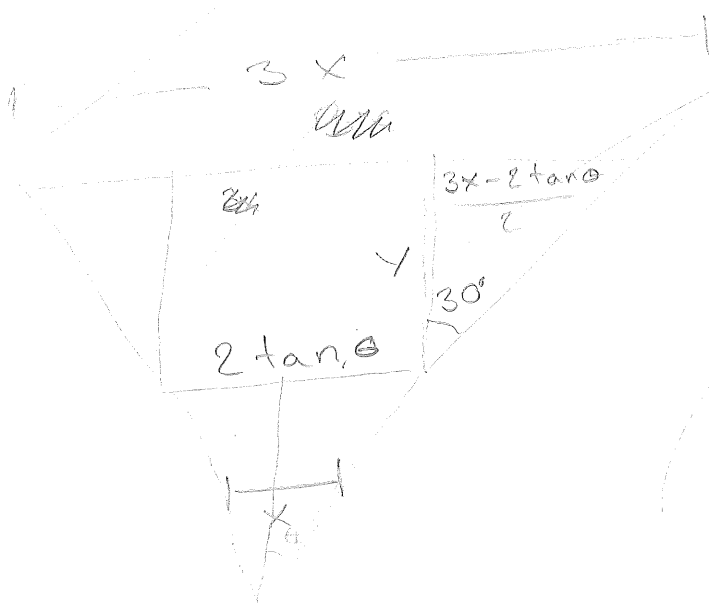
c)



$$\sin 30^\circ = n_2 \sin \theta$$

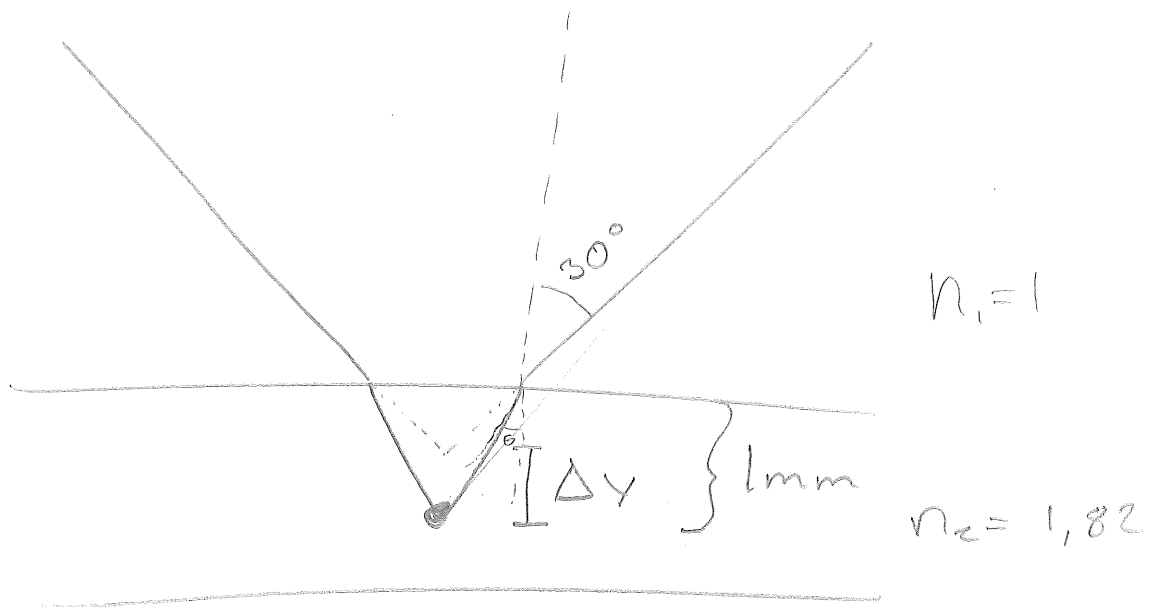
$$\tan \theta = \frac{1}{1}$$

$$\Rightarrow \theta = \arcsin$$



$$\tan 30^\circ = \frac{2y}{3x - 2 \tan \theta}$$

c)



$$\sin 30^\circ = 1,82 \cdot \sin \theta$$

$$s' = \left(\frac{n_2}{n_1} \right) s = \frac{1}{1,82} \cdot 1,00 = \boxed{0,54 \text{ mm}}$$

$$\Delta y = 1 - 0,54 = \underline{0,46 \text{ mm}}$$

Ursprungliga avståndet = 8,5

$$8,5 + 0,46 = \boxed{8,95 \text{ mm}}$$

d) $\Delta \theta = \boxed{15,9^\circ}$

e) Nu går strålarna rakt igen $\Rightarrow 8,5 \text{ mm}$.

f) $\sin^2 \left(\frac{15,9^\circ}{2} \right) \cdot k = \sin^2 \left(\frac{30^\circ}{2} \right)$

$$\boxed{k = 3,5}$$