15.1 Kanske kan vi linjärpolarisera circ-pol-ljus.

15.2 Vid reflektion bildas lin-pol-ljus. Polaroidglasögon är lin pol-åt ena hållet.

15.3

$\theta_1 = \theta$, $\theta_2 = 90 - \theta$

a) $\boxed{I_0 \cos^2\theta \cdot \sin^2\theta}$

$\omega \cdot t = \theta$

b) $I = \frac{I_0}{4} \sin^2 2\theta = \boxed{\frac{I_0}{4} \sin^2(2\omega t)}$

15.4

a) Inget

b) $I_0 \cos^2 45° \cdot \cos^2 45° = I_0 \cdot \frac{1}{2} \cdot \frac{1}{2} = \boxed{\frac{I_0}{4}}$

c) $I_0 \cos^6 30° = I_0 \cdot \frac{\sqrt{3}^6}{2^6} = I_0 \frac{27}{64} \approx \boxed{0{,}42\, I_0}$

d) $I_0 \cos^{2N}(90°/N)$

$\frac{1}{x} = k \qquad x \to \infty \Rightarrow k \Rightarrow 0$

e) $\boxed{\cos^x\left(\frac{1}{x}\right) = \cos^{1/k}(k) = y}$

$\ln y = \ln \cos^{1/k}(k)$

$\ln y = \frac{1}{k} \cdot \ln(\cos k) = \frac{\ln(\cos k)}{k}$

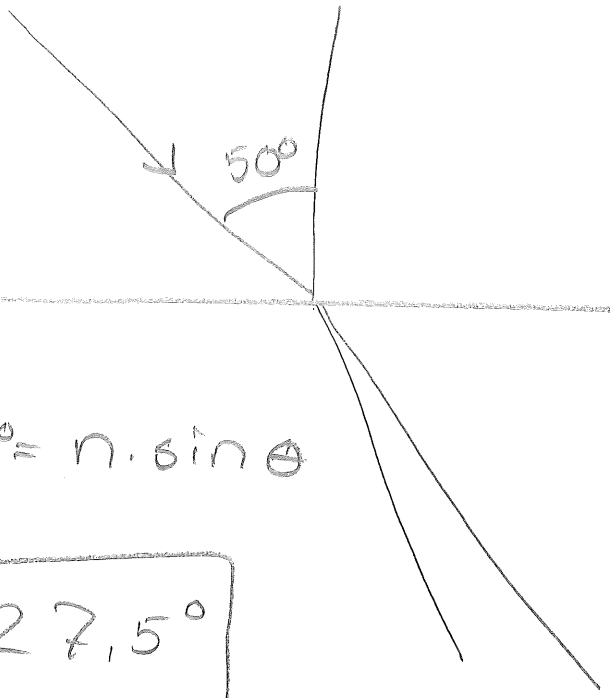
L'Hospital

$\frac{-\frac{1}{\cos k} \cdot \sin k}{1} = -\tan k \to 0$ då $k \to 0$

$\ln y = 0 \Rightarrow \boxed{y = 1}$

$\boxed{I \to I_0 \cdot 1 \text{ då } N \to \infty}$

15.5



$n_o = 1{,}6584$

$n_e = 1{,}4864$

$\sin 50° = n \cdot \sin\theta$

$\theta_o = 27{,}5°$

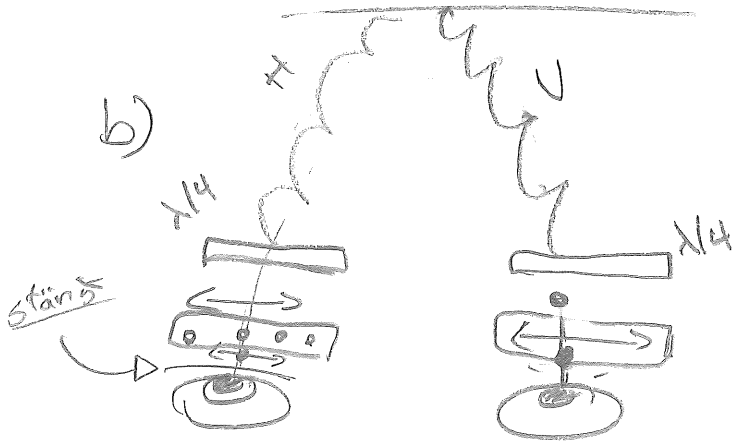
$\theta_e = 31°$

15.6 Innan är två pol som gör circ. -pol H/L

a) Först $\frac{\lambda}{4}$-plate. ⇒ linjeras

sedan linj-pol.

b)



15.7

a) $$\frac{\lambda}{4} = d(n_e - n_o)$$

$\lambda = 486\,nm$

$n_e = 1{,}559$

$n_o = 1{,}5497$

$$\Rightarrow d = \frac{\lambda}{4(n_e - n_o)} = 13\,\mu m$$

b)

FALL 1

Inkommande: $\begin{bmatrix} 1 \\ 1 \end{bmatrix}$ $\begin{bmatrix} 1 & 0 \\ 0 & i \end{bmatrix}$

$$A = \begin{bmatrix} 1 & 0 \\ 0 & -i \end{bmatrix} = B$$

$$AB = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$$

$$AB\,\vec{1} = \begin{bmatrix} 1 \\ -1 \end{bmatrix}$$

15.8

$\Delta n = |n_e - n_o|$

λ_0

d: tjocklek

$\lambda_0 \Delta\theta = 2\pi d \Delta n$