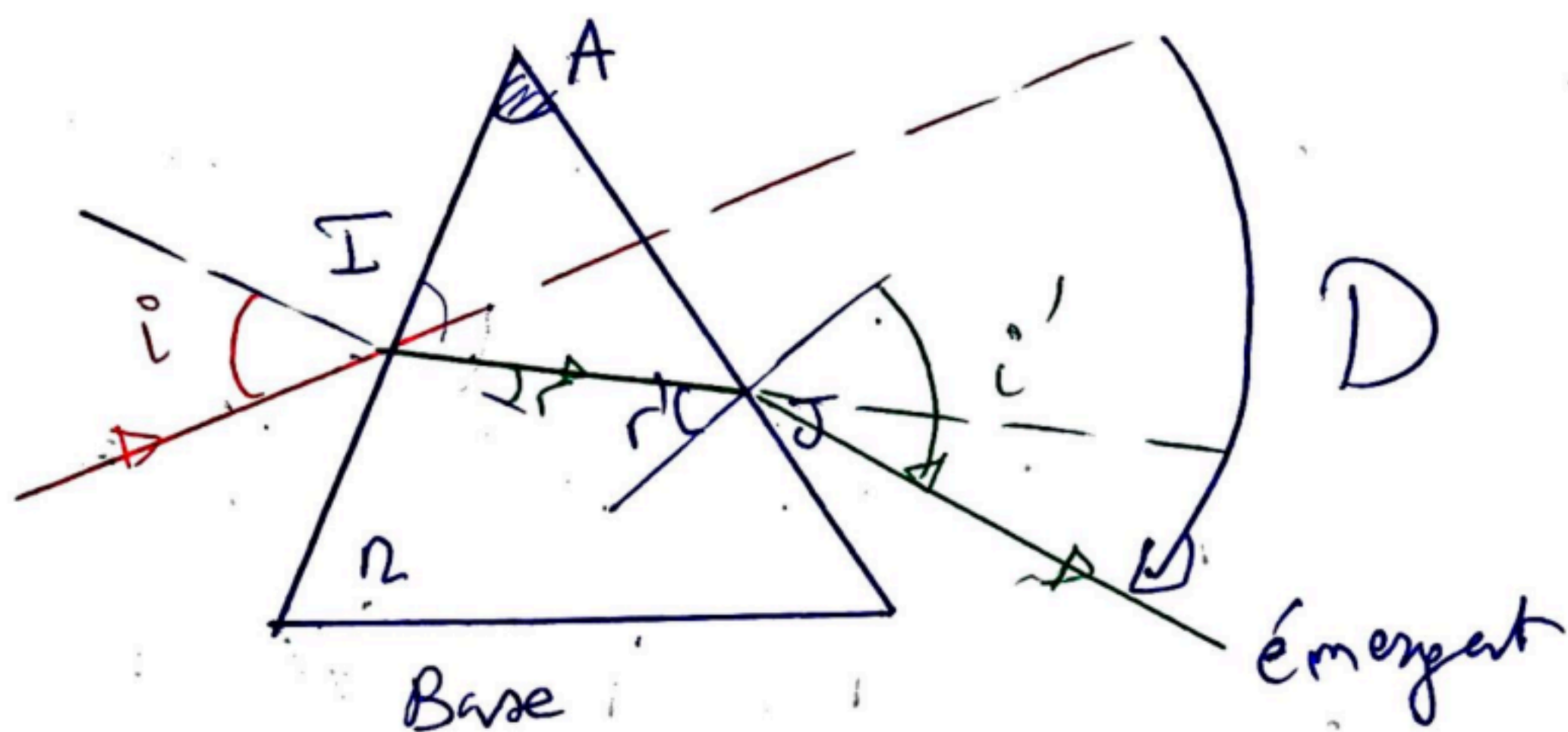




• I: $\sin i = n \sin r$

• D: $\sin i' = n \sin r'$

$$A + \left(\frac{D}{2} - r\right) + \left(\frac{D}{2} - r'\right) = \pi$$

$$\boxed{A = r + r'}$$

$$D = (i - r) + (i' - r') = i + i' - (r + r')$$

$$\boxed{D = i + i' - A}$$

Si les angles faibles

$$\begin{aligned} \sin i &\approx i \\ \sin i' &\approx i' \end{aligned}$$

$$\begin{aligned} i &\approx nr \\ i' &\approx nr' \end{aligned}$$

$$\begin{aligned} D &= n(r + r') - A \\ \boxed{D &= (n - 1)A} \end{aligned}$$

Indikator d'émergence.

$$i' \leq \frac{\pi}{2} \Rightarrow \sin i' \leq 1 \Rightarrow n \sin r' \leq 1$$

$$\sin r' \leq \frac{1}{n} \Rightarrow r' \leq \arcsin\left(\frac{1}{n}\right) = \Lambda$$

$$\text{or } A = r + r' \Rightarrow r' = (A - r)$$

$$r' \leq \Lambda \Rightarrow A - r \leq \Lambda$$

$$r \geq A - \Lambda \Rightarrow$$

$$n \sin r \geq n \sin(A - \Lambda)$$

$$i \geq \arcsin(n \sin(A - \Lambda)) = i_0.$$

$$\star \underline{\underline{\frac{\pi}{2}}} \quad i_0 \leq i \leq \frac{\pi}{2}$$

$$\sin i = n \sin r \leq 1 \Rightarrow r \leq \Lambda$$

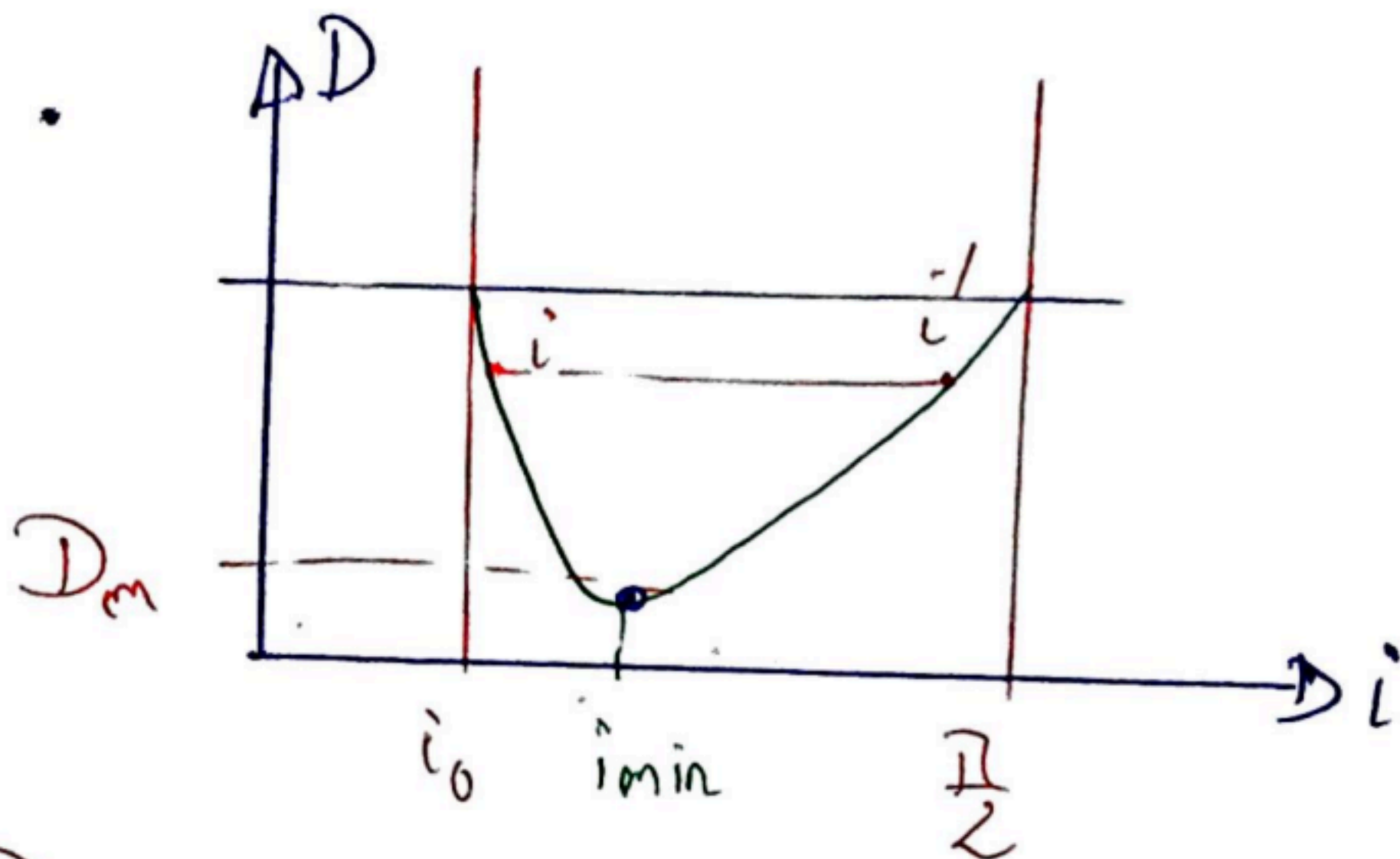
$$\text{or } r' \leq \Lambda$$

$$A = r + r' \leq 2\Lambda$$

$$\text{or } r \geq A - \Lambda \geq 0$$

$$i \geq i_0$$

$$\text{et } 1 \leq A \leq 21$$



$$D = D_m \rightarrow i = i' = i_m$$

$$r = r' = r_m$$

$$A = r + r' = 2r_m$$

$$D_m = 2i_m - A \Rightarrow n = \frac{\sin\left(\frac{A + D_m}{2}\right)}{\sin\left(\frac{A}{2}\right)}$$

$$A = 60^\circ \pm 2'$$

$$\Delta A = 2'$$

$$\Delta D_m = 2'$$

$$?? \frac{\Delta n}{n}$$

$$\ln n = \ln \left(\sin \left(\frac{A + D_m}{2} \right) \right) - \ln \sin \left(\frac{A}{2} \right)$$

$$\frac{d \ln f(x)}{dx} = \frac{f'(x)}{f(x)} \rightarrow d \ln f(x) = \frac{f'(x) dx}{f(x)}$$

$$\boxed{d \ln f(x) = \frac{df(x)}{f(x)}}$$

$$\frac{dn}{n} = \cos \left(\frac{A + D_m}{2} \right) d \left(\frac{A + D_m}{2} \right) - \cos \left(\frac{A}{2} \right) \frac{dA}{2}$$

$$\frac{dn}{n} = \left[\cos \left(\frac{A + D_m}{2} \right) - \cos \left(\frac{A}{2} \right) \right] \frac{dA}{2} + \cos \left(\frac{A + D_m}{2} \right) \frac{dD_m}{2}$$

$$\frac{\Delta n}{n} = \left[\cos \left(\quad \right) - \cos \left(\frac{A}{2} \right) \right] \frac{\Delta A}{2} + \cos \left(\quad \right) \frac{\Delta D_m}{2}$$