So:

From (7): $$\frac{\partial f}{\partial x} = \tan\theta_T = \frac{\cos\theta_c - \frac{n_a}{n_p}\cos\theta_o}{\sin\theta_c - \frac{n_a}{n_p}\sin\theta_o}$$

θ_o is a variable independent of x that can take any value between 0 and $\frac{\pi}{2}$.
If we let $\theta_o \equiv x$ we will have that for each x there will be the appropriate curve to couple to some θ_o.

So to trace the curve we can integrate

$$\boxed{\frac{\partial f}{\partial x} = \frac{\overset{\text{constant}}{\cos\theta_c} - \frac{n_a}{n_p}\cos x}{\sin\theta_c - \frac{n_a}{n_p}\sin x}} \quad (8)$$

, θ_c given by $\sin\theta_c = \sqrt{\frac{\varepsilon_a \varepsilon_m}{(\varepsilon_a + \varepsilon_m)\varepsilon_p}}$.

Working at 635 nm (laser available in the lab):

$$\begin{cases} \varepsilon_a = 1{,}00059 \\ \varepsilon_p = 2{,}04 \\ \varepsilon_m = -12 \end{cases} \qquad \begin{cases} n_a = 1{,}000293 \\ n_p = 1{,}429 \end{cases}$$

$$\Rightarrow \theta_c = \sin^{-1}\left(\sqrt{\frac{1{,}00059 \cdot (-12)}{(1{,}00059 - 12)\,2{,}04}}\right) \simeq 47{,}0^{\circ}$$

- Plug these into 8 and use maple to integrate: