Homework #1

1. Calculate the following values for the slab waveguide described in Fig. A.
   (a) numerical aperture (NA)
   (b) maximum light acceptance angle $\theta_{\text{max}}$
   (c) cut-off wavelength $\lambda_c$

   \[
   \begin{align*}
   n_0 &= 1.445 \\
   n_1 &= 1.456 \\
   n_0 &= 1.445
   \end{align*}
   \]

   \[6 \, \mu \text{m}\]

   Fig. A

2. Using Eq. (1.14), please re-plot Figure 1.5 for $m=0,1,2...10$, $0 \leq \xi \leq 1$, and $0 \leq \eta \leq 20$. 