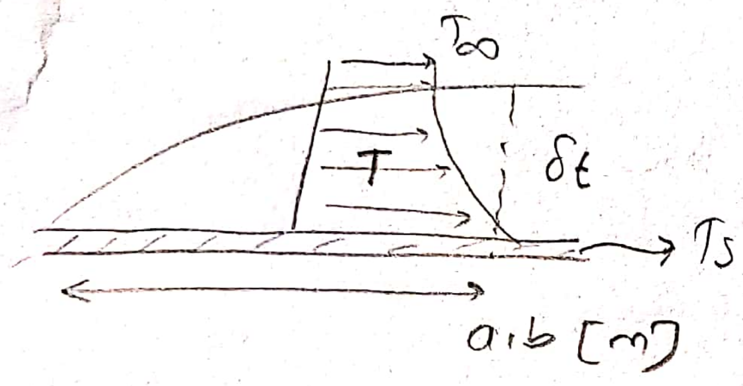

$k_s = 1ab\ [W/m.K]$

$k_f = 0.ab\ [W/m.K]$

$$\frac{T_s - T}{T_s - T_\infty} = \sin\left(\frac{\pi y}{0.0ab}\right)$$

δ_t is where $\frac{T_s - T}{T_s - T_\infty}$ is equal to 0.99;

$$\frac{T_s - T}{T_s - T_\infty} = \sin\left(\frac{\pi y}{0.0ab}\right) = 0.99$$

$$\Rightarrow y = \delta_t = \frac{(0.0ab)}{\pi} \times \sin^{-1}(0.99)$$

$$h = \frac{-k_f \, \partial T/\partial y \,|_{y=0}}{T_s - T_\infty}$$

$$T(y) = \sin\left(\frac{\pi y}{0.0ab}\right) \times (T_\infty - T_s) + T_s$$

$$\frac{\partial T(y)}{\partial y} = \frac{\pi}{0.0ab} \cos\left(\frac{\pi y}{0.0ab}\right)(T_\infty - T_s)$$

$$\left.\frac{\partial T}{\partial y}\right|_{y=0} = \frac{\pi}{0.09b}\underbrace{\cos(0)}_{1}(T_\infty - T_s)$$

Thus,

$$h = \frac{(-0.9b) \times \frac{\pi}{0.09b}\cancel{(T_\infty - T_s)}}{\cancel{(T_s - T_\infty)}}$$

$$\boxed{h = 0.ab \times \frac{\pi}{0.09b}} \quad [W/m^2K]$$

c)

$$Nu = \frac{hL}{kf} = \frac{\overbrace{0.ab \times \frac{\pi}{0.ab}}^{h} \times \overbrace{a.b}^{L}}{\underbrace{0.ab'}_{kf}}$$

CamScanner ile tarandı