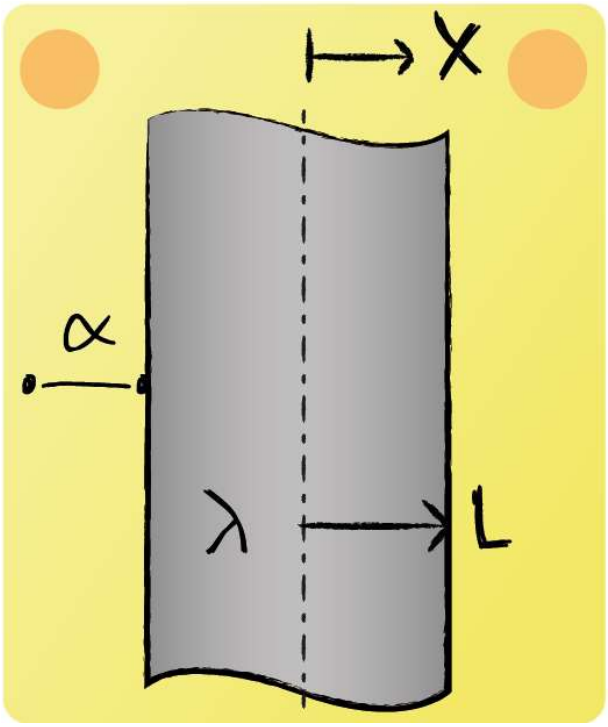
Lecture 10 - Question 5



A sheet made out of aluminum is cooling down. It has a thermal conductivity of $\lambda = 200$ W/mK. Besides it has a characteristic length of L = 0.01 m and a convective heat transfer coefficient of $\alpha = 20\ W/m^2K$. Which statement is true?

Since Bi << 1, as x increases the drop of the temperature profile inside the body is negligible relative to the drop of the temperature profile outside the body.

$$Bi = \frac{\alpha \cdot L}{\lambda} = \frac{20 \cdot 0.01}{200} = 1 \cdot 10^{-3}$$

$Bi << 1$, implying that the temperatures inside the body will not vary significantly relative to the temperature profile outside the body.