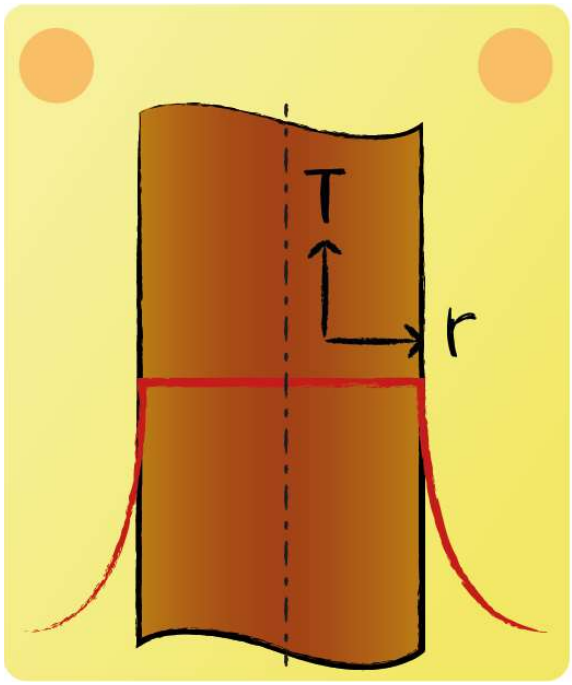
Lecture 14 - Question 2



Which condition for the Biot number must be met when using the lumped capacity model?

$$\theta^* = 1 - e^{-\frac{\alpha A}{\rho c_p V} t} = 1 - e^{-[Bi \cdot Fo]}$$

$Bi << 1$

The lumped capacity model is a common approximation in transient conduction, which may be used whenever heat conduction within an object is much faster than heat transfer across the boundary of the object. Which is the case for $Bi << 1$.