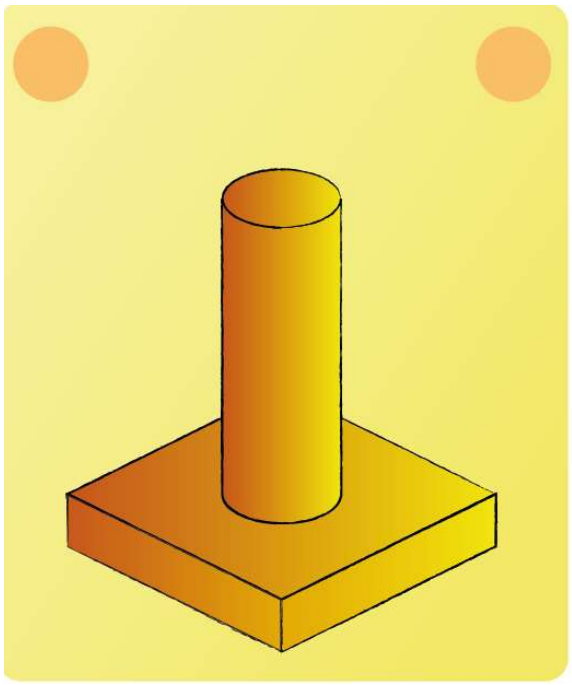
Lecture 12 - Question 4



Give the unit of the fin efficiency, by checking the unit of:

$$\eta_R = \frac{tanh(mL)}{mL}$$

$$m = \left(\frac{(\alpha)(U)}{(\lambda)(A_c)}\right)^{1/2}$$

$$[m] = \left(\frac{(W^1 m^{-2} K^{-1})(W^0 m^1 K^0)}{(W^1 m^{-1} K^{-1})(W^0 m^2 K^0)}\right)^{1/2} = m^{-1}$$

$$[L] = m^1$$

$$\eta_R = \frac{tanh(mL)}{mL}$$

$$[\eta_R] = \left(\left(\frac{(m^{-1})(m^1)}{(m^{-1})(m^1)}\right)\right) = 1 = [-]$$

Thus the fin efficiency is a dimensionless number.