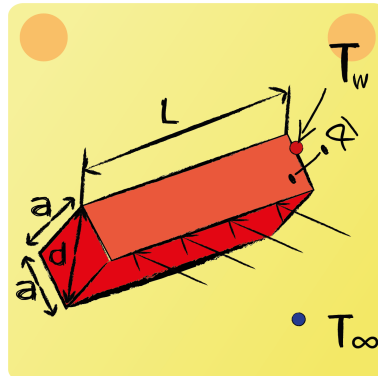# Lecture 6 Question 5.2

Give an expression for the rate of heat transfer $\dot{Q}$. Assume steady-state heat transfer and the body to have a homogeneous temperature and neglect heat transfer at the sides.

Rate of heat transfer by convection:

$$\dot{Q} = \overline{\alpha} \cdot A_{\text{s}} \cdot (T_{\text{w}} \cdot T_{\infty})$$

Surface area:

$$A_{\text{s}} = 4 \cdot a \cdot L$$