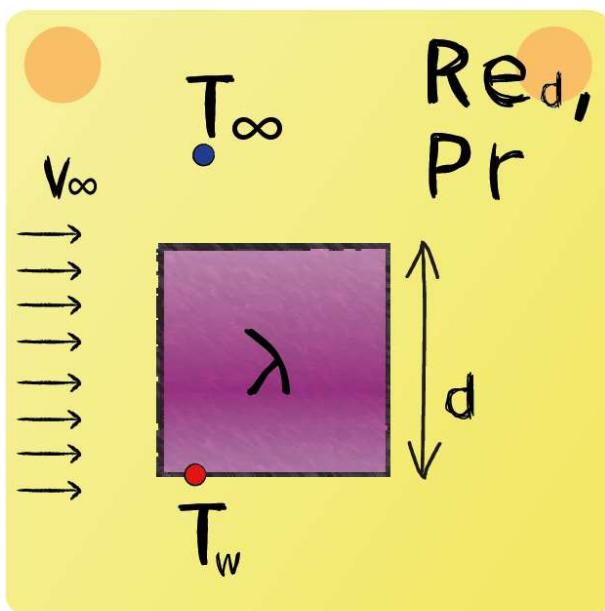


Lecture 6 - Question 5



Consider a transverse flow of an ideal gas around a square cylinder. Assume steady-state heat transfer. Determine the heat loss of the square cylinder.



$$\overline{Nu_d} = 0.102 \cdot Re_d^{0.675} Pr^{0.4} = 45.07$$

$$\bar{\alpha} = \frac{\overline{Nu_d} \cdot \lambda}{d} = 45.07 \cdot 10^2 \text{ W/m}^2\text{K}$$

$$\dot{Q}_{conv} = \bar{\alpha} \cdot A \cdot (T_w - T_\infty) = 72.12 \text{ kW}$$