

WEEK 1

Conductive heat transfer

- Thermal conduction is a heat propagation/exchange phenomenon due to the contact between particles without a macroscopic displacement of matter.
- This is the only propagation/exchange modality which occurs within solids.

Question:

$L = 0.4 \text{ m}$, $A = 20 \text{ m}^2$, $\Delta T = 25$ and $k = 0.78 \text{ W/mK}$

1. simple method

$$Q = kA\Delta T/L = 975 \text{ W}$$

2. thermal method

$$R_{\text{wall}} = s/kA \approx 0.02564 \text{ K/W}$$

$$Q = \Delta T/R_{\text{wall}} \approx 975.04 \text{ W}$$