Fenômenos de transporte ⇒ Exercício semanal

2.1) $Q = 3000\,W$; $A = 10\,m^2$; $L = 0{,}025\,m$; $T_{quente} = 415$; $K = 0{,}2\,W$

$$Q = \frac{K \cdot A}{L} \cdot (T_1 - T_2) \Rightarrow T_1 - T_2 = \frac{Q \cdot L}{K \cdot A} \Rightarrow 415 - T_2 = \frac{3000 \cdot 0{,}025}{0{,}2 \cdot 10}$$

$$415 - T_2 = 37{,}5 \Rightarrow T_2 = 415 - 37{,}5 = 377{,}5\,°C //$$

2.2) $L = 0{,}005\,m$; $T_{ant} = 24$; $T_{est} = 38$; $H = 1$; $L_3 = 3$; $K = 1{,}4\,W$

$A = 1 \cdot 3 = 3\,m^2$; $\Delta T = 14\,°C$; $Q = \frac{K \cdot A \cdot \Delta T}{L} = \frac{1{,}4 \cdot 3 \cdot 14}{0{,}005} = 1176\,W //$

2.3) $K = 0{,}026\,W$; $Q = 500\,W$; $T_{ant} = -10$; $T_{est} = 35\,°C$

$A_{topo} = 8 \cdot 4 = 32\,m^2$; $A_{lados} = 2 \cdot 24 + 2 \cdot 12 = 72\,m^2$

$A = 32 + 72 = 104\,m^2 \Rightarrow \Delta t = 35 + 10 = 40\,°C$

$$Q = \frac{K \cdot A \cdot \Delta T}{L} \Rightarrow L = \frac{K A \Delta T}{Q} = \frac{0{,}026 \cdot 104 \cdot 48}{500} = 0{,}24336\,m //$$