

64. We divide both sides of Eq. 19-32 by area A , which gives us the (uniform) rate of heat conduction per unit area:

$$\frac{P_{\text{cond}}}{A} = k_1 \frac{T_H - T_1}{L_1} = k_4 \frac{T - T_C}{L_4}$$

where $T_H = 30^\circ\text{C}$, $T_1 = 25^\circ\text{C}$ and $T_C = -10^\circ\text{C}$. We solve for the unknown T .

$$T = T_C + \frac{k_1 L_4}{k_4 L_1} (T_H - T_1) = -4.2^\circ\text{C} .$$