

109. (a) The 8.0 cm thick layer of air in front of the glass conducts heat at a rate of

$$P_{\text{cond}} = kA \frac{T_H - T_C}{L} = (0.026)(0.36) \frac{15}{0.08} = 1.8 \text{ W}$$

which must be the same as the heat conduction current through the glass if a steady-state heat transfer situation is assumed.

- (b) For the glass pane,

$$\begin{aligned} P_{\text{cond}} &= kA \frac{T_H - T_C}{L} \\ 1.8 &= (1.0)(0.36) \frac{T_H - T_C}{0.005} \end{aligned}$$

which yields  $T_H - T_C = 0.024 \text{ C}^\circ$ .