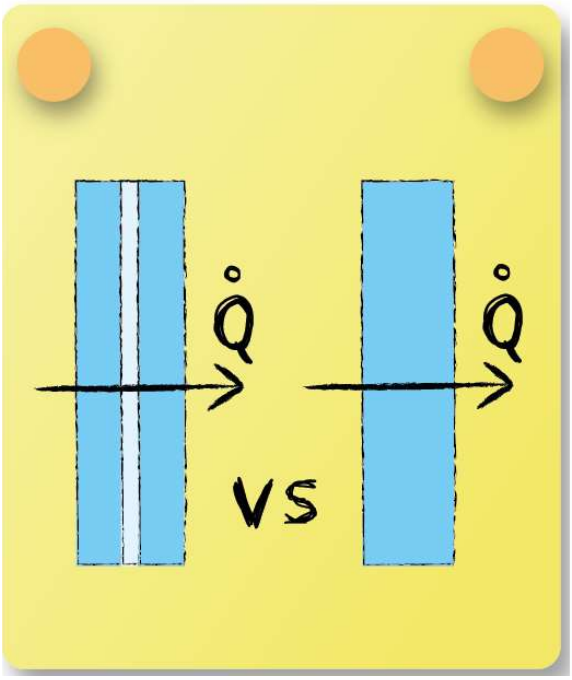
Lecture 7 - Question 6



Consider a window glass consisting of two 4-mm thick glass sheets with a stagnant gas in between. Compare the heat transfer rate through this window with that one consisting of a single 8-mm-thick glass sheet under identical conditions.
More heat is being transferred through the single 8-mm-thick glass sheet, due to the fact that this has the lowest thermal resistance.

In the figure below the resistor networks for the two types of windows can be seen. The lower one is for the is for the single 8-mm-thick glass sheet. Where the upper one is for the double 4-mm-thick glass sheets. The magnitude of the sum of the outer resistors for the upper one is identical to the magnitude of the single resistor below. The upper network has an additional resistor in between due to stagnant gas, implying that two-4mm-thick glass sheets with stagnant gas has a higher thermal resistance. Thus less heat will pass through two 4-mm-thick glass sheets compared to single 8-mm-thick glass sheet.