WEEK ASSIGNMENT 1

Question:
A short summary about the conductive heat transfer and solving the same
exercise with: L= 0.4 m, A= 20 m2, ΔT= 25, and k=0.78 W/m K using both
simple method and using the resistance concept.

Summary:

Conduction is heat transfer through solid materials where temperature is
different in different parts of solids. Heat transfer with conduction method
happens within a body or from one body to another due to transfer by
molecules vibrating at their positions. The better the conductor the more
rapidly heat will be transferred. For example good conduction of heat is metal.

Solution:

Simple method:

$$\dot{Q} = kA\frac{\Delta T}{L} = 0.78\frac{W}{mK} * 20m2 * \frac{25K}{0.4m} = 975w$$

Using the resistence concept:

$$Rwall = \frac{L}{kA} = \frac{0.4m}{0.78\frac{W}{mK}*20m2} \approx 0.02564\frac{K}{W}$$

$$\dot{Q} = \frac{\Delta T}{Rwall} = \frac{25K}{0.0256K\frac{K}{W}} \approx 976.6W$$