WEEK 1

A short summary about the conductive heat transfer and solving the same exercise with L=0.4m, A= 20 m^2, Δ = 25, and k=0.78 W/m K using both simple method and using the resistance concept.

Summary：

Heat transfer through the wall of a house can be modeled as steady and one-dimensional. The temperature of the wall in this case depends on one direction only (say the x-direction) and can be expressed as T(x).

In steady operation, the rate of heat transfer through the wall is constant.

Simple Method:

$Q_{cond,wall}$=kA$\frac{T_1 - T_2}{L}$ =0.78*20*$\frac{25}{0.4}$ =975W

Thermal Resistance Concept:

R_{wall}=$\frac{L}{kA}$ =$\frac{0.4}{0.78*20}$ $\approx$0.0256 K/W

$Q_{cond,wall}$=$\frac{T_1 - T_2}{R_{wall}}$ =$\frac{25}{0.0256}$ $\approx$976.6W