Azra Ozyurt - Submission 1

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Conductive heat transfer can be summurised as heat moving from one space to another through a solid space. High energy molecules transfering energy to low energy molecules. Heat flows in direction of decreasing temperature.
The amount of energy that moves depends on the conductivity of the matter(k), area of the solid space that heat moves through(A), temprature difference in between spaces (ΔT), and thickness of the material heat is moving through(L). Thickness, conductivity and the area of the material is related with the resistance of the material. (R).

Question;

$k = 0.78\ W\ /\ mC$

$\mathrm{A} = 20\ \mathrm{m}^2$

$\Delta T = 25\ C$

$\mathrm{L} = 0.3\mathrm{m}$

$\dot{\mathrm{Q}} = ?$

Method 1

$$\dot{\mathrm{Q}} = \mathrm{kA}\frac{\Delta T}{L} = 0.78 * 20 * \frac{25}{0.4} = 975\ W$$

Method 2 (Resistance method)

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

$$\dot{Q} = \frac{\Delta T}{R_{Wall}} = \frac{25}{0.019} = 976.5\ W$$