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1 Short summary about the conductive heat transfer.

The rate of heat conduction through a plane wall

- Is proportional to the average thermal conductivity (willingness of material to transfer heat), the wall area and the temperature difference.
- But is inversely proportional to the wall thickness (the thicker the wall, the less heat goes through it).
- Once the rate of heat conduction is available, the temperature $T(x)$ at any location x can be determined by replacing t by T and L by x

2 Solving the same class exercise where L=0.4m, A=20m2, $\Delta T = 25$, and K= 0.78w/mK using both simple and resistance methods.

- Simple method

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

- Resistance method

$$R_{wall} = \frac{L}{kA} \qquad \dot{Q} = \frac{\Delta T}{R_{Wall}}$$
$$= \frac{0.4}{0.78 * 20} \qquad = \frac{25}{0.0256° \frac{C}{W}}$$
$$= 0.0256\ ° \frac{C}{W} \qquad = 976.5\ W$$