

# Assignment 1. FTorresPerez

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Conductive heat transfer refers to the way heat is transferred through a specific material.

In the case of a building heat transfer through one of its walls can be modelled as steady and one-dimensional.

Heat transfer is proportional to its area, to the difference of temperature and to the conductivity, which refers to the willingness of a material to transfer heat. It is also proportional to the thickness of a material. As an example, the thicker the wall, the less heat goes through it.

Exercise:

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

$$\Delta T = 25$$

$$K = 0,78 \text{ W/mK}$$

$$L = 0,4 \text{ m}$$

\*Note: I couldn't find the way to put the point over the letter Q

Simple way:

$$Q = K \cdot A \cdot (\Delta T / L)$$

$$Q = 0,78 \cdot 20 \cdot (25 / 0,4)$$

$$Q = 0,78 \cdot 20 \cdot 62,5$$

$$Q = 15,6 \cdot 62,5$$

$$Q = 975 \text{ Watts}$$

Hard way:

$$R_{\text{Wall}} = L / (K \cdot A) \quad Q = (\Delta T / R_{\text{Wall}})$$

$$R_{\text{Wall}} = 0,4 / (0,78 \cdot 20)$$

$$R_{\text{Wall}} = 0,4 / (15,6)$$

$$R_{\text{Wall}} = 0,02564103$$

$$Q = (\Delta T / R_{\text{Wall}})$$

$$Q = (25 / 0,02564103)$$

$$Q = 974,999 \text{ Watts}$$

