HOMEWORK EXERCISE

$$\dot{Q} = kA \times \frac{\Delta T}{L}$$

$$\dot{Q} = 0.78 \times 20 \times \frac{25}{0.4} = 975\,W$$

$$Rwall = \frac{\mathrm{L}}{kA} = \frac{0.4}{0.78 \times 20} = 0.0256°C/W$$

$$\dot{Q} = \frac{\Delta T}{Rwall} = \frac{25}{0.0256} = 976.5625\,W$$

LESSON NOTES

$$\dot{Q} = \frac{\mathrm{dQ}\ (\mathrm{energy})}{dt\ (time)}\ \frac{\mathrm{J}}{s} \rightarrow W\ (power)$$

$\rightarrow$ *semplified conclusion of Fourier's law of heat conduction:*

$$\dot{Q} = kA \times \frac{\Delta T}{L}$$

$\rightarrow$ *temperature unit is* $K = °C + 273.15$

$\rightarrow$ *the rate of heat conduction through a plane is:*

$-$*inversely proportional to the wall thickeness*

$\rightarrow$ *that's why the thicker the wall, the less heat goes through it*

$-$*directly proportional to the area, the difference of temperature and conductivity*

$\rightarrow$ *Conducivity: willingness of materials to tranfer heat* $\left(\frac{W}{mk}\right)$

$\rightarrow$ *This formula can be expressed also with:*

$$Rwall = \frac{\mathrm{L}}{kA}$$

$\rightarrow$ *replacing the values it become:*

$$\dot{Q} = \frac{\Delta T}{Rwall}$$