

**ΕΝΔΕΙΚΤΙΚΕΣ ΑΠΑΝΤΗΣΕΙΣ:**

**Θέμα 4°**

**α)**  $t = 1 \text{ λεπτό} = 60 \text{ s}$

$L = 10 \text{ mm} = 0,01 \text{ m}$

$\theta_1 = 100 \text{ }^\circ\text{C} = 373 \text{ K}, \theta_2 = 20 \text{ }^\circ\text{C} = 293 \text{ K}$

$\Delta\theta = \theta_1 - \theta_2 = 373 \text{ K} - 293 \text{ K} = 80 \text{ K}$

$$Q = \lambda \cdot t \cdot \frac{A}{L} \cdot (\theta_1 - \theta_2) \Rightarrow Q = 58 \frac{W}{m \cdot K} \cdot 60 \text{ s} \cdot \frac{2 \text{ m}^2}{0,01 \text{ m}} \cdot 80 \text{ K} \Rightarrow$$

$$Q = 55.680.000 \text{ W} \cdot \text{s} \Rightarrow Q = 55.680 \text{ KW} \cdot \text{s} \Rightarrow Q = 55.680 \text{ KJ}$$

**β)**  $\dot{Q} = \frac{Q}{t} \Rightarrow \dot{Q} = \frac{55680 \text{ KJ}}{60 \text{ s}} = \frac{55680 \text{ KW} \cdot \text{s}}{60 \text{ s}} \Rightarrow \dot{Q} = 928 \text{ KW}$