Lecture 1 - Question 4
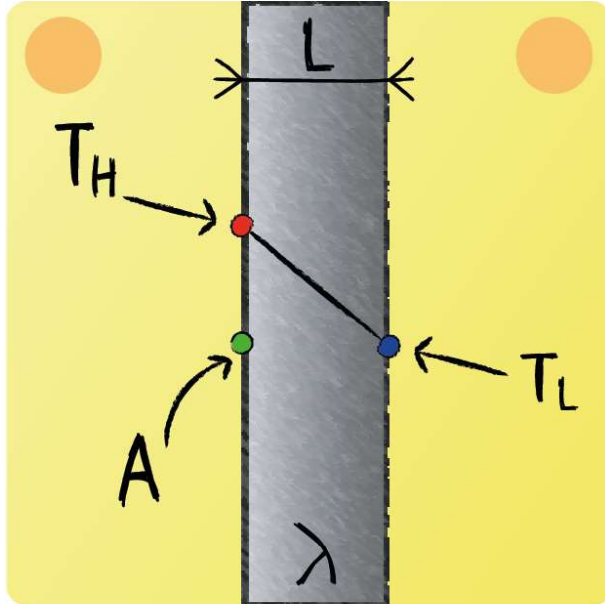

Select the correct equation for one-dimensional heat conduction.

$$\dot{Q} = -A\,\lambda\,\frac{\mathrm{d}T}{\mathrm{d}x}$$

Since temperature is the driving potential for heat conduction the heat flux is proportional to it's gradient $\frac{\mathrm{d}T}{\mathrm{d}x}$. The negative sign states that heat is conducted towards lower temperatures. Material properties are accounted for by the thermal conductivity λ as the geometry is considered by area A.