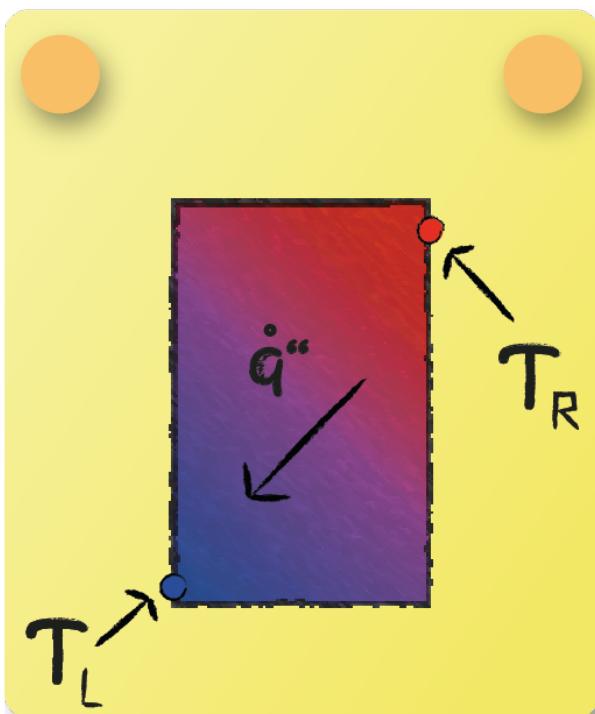


Lecture 2 - Question 3



What statements are correct regarding the 2-D heat conduction equation with sources?

The general heat conduction equation derived for a control volume with constant thermal conductivity can be written as:



$$\frac{\rho c}{\lambda} \frac{\partial T}{\partial t} = \frac{\partial^2 T}{\partial x^2} + \frac{\partial^2 T}{\partial y^2} + \frac{\partial^2 T}{\partial z^2} + \frac{\dot{\Phi}'''}{\lambda}$$

In case of a steady two-dimensional problem the equation simplifies to:

$$0 = \frac{\partial^2 T}{\partial x^2} + \frac{\partial^2 T}{\partial y^2} + \frac{\dot{\Phi}'''}{\lambda}$$

This form is also known as the Poisson equation.