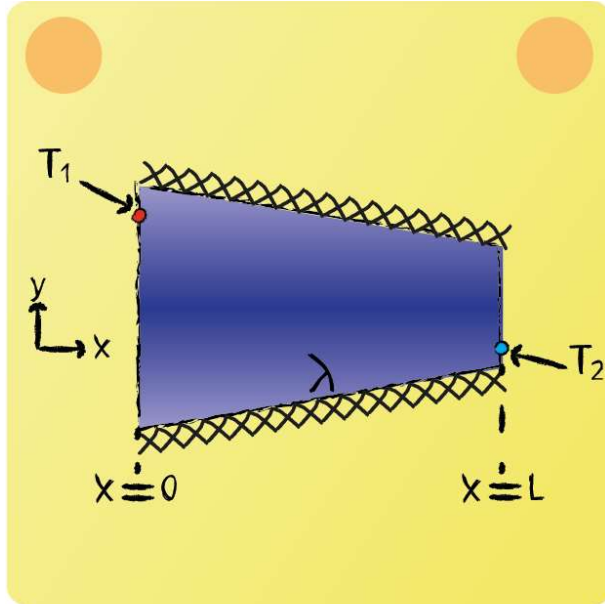


Lecture 2 - Question 1



How many boundary conditions are needed to solve the steady one-dimensional conduction equation?

For steady and one dimensional problems the conduction equation simplifies to:

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



A solution is obtained by integrating the equation twice yielding two unknowns. These integration constants can be specified by two boundary conditions. At least one is needed as a boundary temperature and a further either in form of a temperature gradient or temperature at a second position.