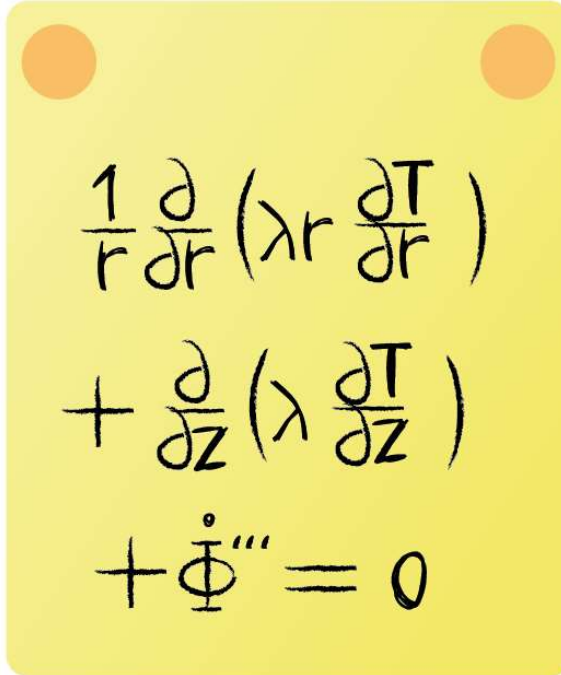


## Lecture 13 - Question 4



$$\frac{1}{r} \frac{\partial}{\partial r} \left( \lambda r \frac{\partial T}{\partial r} \right) + \frac{\partial}{\partial z} \left( \lambda \frac{\partial T}{\partial z} \right) + \dot{\Phi}''' = 0$$

Consider a medium in which the heat conduction equation is given in its simplest form as:

$$\frac{1}{r} \frac{\partial}{\partial r} \left( \lambda r \frac{\partial T}{\partial r} \right) + \frac{\partial}{\partial z} \left( \lambda \frac{\partial T}{\partial z} \right) + \dot{\Phi}''' = 0$$

How many boundary conditions are needed to solve the equation?



Four boundary conditions

From the heat conduction equation it can be seen that it is a two-dimensional problem. One knows that for a one-dimensional problem two boundary conditions are required. Thus four boundary conditions are required.