Summary of lecture 3 - Higher order derivatives

- HIGHER ORDER DERIVATIVES: Let u be a function of $x, y, \ldots$ then u_x and u_y are functions of $x, y, \ldots$.
- So we define

$$\frac{\partial^2 u}{\partial x^2} = \frac{\partial}{\partial x}(u_x) = u_{xx}, \quad \frac{\partial^2 u}{\partial y \partial x} = \frac{\partial}{\partial y}(u_x) = u_{xy},$$

- We will always assume that u is n-times differentiable with continuous derivatives, so

$$u_{xy} = u_{yx}, etc.$$