

Notes on Math 322: PDE

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1. Notations

The following notations are used in this note:

- Partial Derivatives

$$\partial_t u = \frac{\partial u}{\partial t} = u_t, \quad \partial_t^2 u = \frac{\partial^2 u}{\partial x^2} = u_{tt} \quad [1]$$

- Laplacian

$$\begin{aligned} \nabla^2 &\equiv \nabla \cdot \nabla \\ \nabla^2 u &= \partial_x^2 u + \partial_y^2 u + \partial_z^2 u = u_{xx} + u_{yy} + u_{zz} \end{aligned} \quad [2]$$

2. Head Equation