第一次作业

1. 指出下面方程的类型, 阶数和是否齐次, 并求解。

(1) $u_{xy} = x + y,$

(2) $\frac{\partial u}{\partial x} + \frac{\partial^2 u}{\partial x \partial y} = 0$ $(u = u(x, y, z)).$

2. 证明函数 $u = \frac{1}{4\pi r}, r = \sqrt{x^2 + y^2 + z^2} \neq 0$, 满足 $\triangle_3 u = (\partial_{xx} + \partial_{yy} + \partial_{zz}) u = 0.$