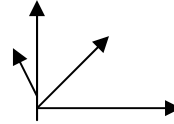# General forms of Cauchy Riemann equations

$$\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}$$

$$\frac{\partial u}{\partial y} = -\frac{\partial v}{\partial x} \qquad \text{xy coordinate}$$

$$\frac{\partial u}{\partial n} = \frac{\partial v}{\partial t}$$

$$\frac{\partial u}{\partial t} = -\frac{\partial v}{\partial n} \qquad \text{normal and tangent coodinate}$$

$$\frac{\partial u}{\partial r} = \frac{1}{r}\frac{\partial v}{\partial \theta}$$

$$\frac{1}{r}\frac{\partial u}{\partial \theta} = -\frac{\partial v}{\partial r} \qquad \text{polar coodinate}$$