

$$u \, dx + v \, dy = 0$$

$$u \, dx = -v \, dy$$

$$\frac{dy}{dx} = -\frac{v}{u}$$

$\frac{dy}{dx}$ = slope of stream line.

* Relation between Stream function & velo. Potential function (i.e. ψ & ϕ) :-

$$u = -\frac{\partial \phi}{\partial x}$$

$$\frac{\partial \psi}{\partial y} = u$$

$$v = \frac{\partial \phi}{\partial y}$$

$$-\frac{\partial \psi}{\partial x} = v$$

$$u = -\frac{\partial \phi}{\partial x} = \frac{\partial \psi}{\partial y}$$

$$v = \frac{\partial \phi}{\partial y} = -\frac{\partial \psi}{\partial x}$$

$$\left[\begin{array}{l} \frac{\partial \psi}{\partial y} = \frac{\partial \phi}{\partial x} \\ \frac{\partial \psi}{\partial x} = -\frac{\partial \phi}{\partial y} \end{array} \right]$$