Particle Paths: $\frac{d\underline{x}}{dt} = \underline{u}$

Streamline: $\frac{dx}{u} = \frac{dy}{v} = \frac{dz}{w}$

Material Derivative: $\frac{D}{Dt} \equiv \frac{\partial}{\partial t} + \underline{u} \cdot \nabla$

Divergence theorem: $\int_V \nabla \cdot \underline{a} dV = \int_S \underline{a} \cdot \underline{n} dS$

Integral form of continuity equation: $\int_V \frac{\partial r}{\partial t} dV = -\int_S r \underline{u} \cdot \underline{n} dS$

Derivative form of continuity equation: $\frac{Dr}{Dt} + r(\nabla \cdot \underline{u}) = 0$

Integral form of hydrostatic equilibrium: $\int_V r \underline{F} dV = \int_S r \underline{n} dS$

Derivative form of hydrostatic equilibrium: $\nabla \underline{p} = r \underline{F}$

Euler's equation: $\frac{D\underline{u}}{Dt} = -\frac{1}{r} \nabla \underline{p} + \underline{F}$

Bernoulli's equation: $\frac{1}{2} \underline{u} \cdot \underline{u} + \int \frac{dp}{r} + \Omega = const$

Vorticity: $\underline{w} = \nabla \times \underline{u}$

Stream functions: $\underline{u} = \left(\frac{\partial y}{\partial y}, -\frac{\partial y}{\partial x} \right)$

$\underline{u} = \left(\frac{1}{r} \frac{\partial y}{\partial q}, -\frac{\partial y}{\partial r} \right)$

$\underline{u} = \left(\frac{1}{r^2} \frac{\partial y}{\partial q}, -\frac{1}{r \sin q} \frac{\partial y}{\partial r} \right)$

Scalar Potential: $\underline{u} = \nabla f = \left(\frac{\partial f}{\partial x}, \frac{\partial f}{\partial y} \right)$

Complex potential: $w(z) = f + iy$

Complex velocity: $\frac{dw}{dz} = u - iv$

Streamlines: $y = \mathrm{Im}(w) = const$

Uniform stream: $w(z) = Uze^{-ia}$

Source: $w(z) = \frac{m}{2p} \log(z - z_0)$

Vortex: $w(z) = -\frac{ik}{2p} \log(z - z_0)$

Dipole: $w(z) = -\frac{me^{ia}}{2p(z - z_0)}$

Flow in a corner: $w(z) = Az^m$