1. A doublet of strength $\Lambda = 20\ ft^3/s$ is formed by a source located at $a = 10\ ft$ to the left of the $y$-axis ($x = -a, y = 0$), and a sink located at $10\ ft$ to the right of the y-axis ($x = a, y = 0$). The free steam velocity is $10\ ft/s$. Determine the magnitude of the velocity at the point (15,15).

2. A potential flow is created by two vortices. A clockwise vortex at $(-a, 0)$ and a counterclockwise vortex of equal strength at $(a, 0)$.

   (a) Determine the stream function for this flow
   (b) Determine the pressure distribution at the plane of symmetry $x = 0$

3. Potential flow impinging on a flat plate forms a *Stagnation Point* at the origin (in 2-D this is a line). The stream function for this flow is represented by $\psi = Axy$, where $A$ is a constant. If a source of strength $m$ is added at the origin, the flow can be described by the figure below showing a "bump" of height $h$.

   Determine the relationship between the bump height $h$, the constant $A$, and the source strength $m$.



Source