Solution for HW6

**S6.1**

Thus,

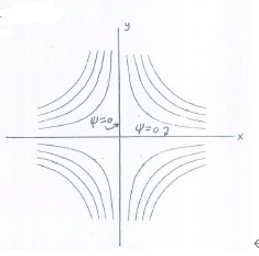
Since is not zero everywhere the flow is not irrotational.

**S6.2**

Similarly,

To satisfy both equation

For a given a, the streamline pattern is obtained by setting equal to various constant. For the x and y axes are streamlines and for other values of the streamline are rectangular hyperbolas as shown in Fig.



**S6.3**

**Fluid Description.** Since the velocity is not a function of time, the flow is steady. The fluid is an ideal fluid.

**Volumetric Dilatation.**

**Rotation.** The angular velocity of the fluid element at B is defined by Equation.

Therefore, the fluid element will not rotate about the z axis. Actually, the above two results apply at all points in the fluid, since they are independent of x and y. In other words, an ideal fluid is incompressible and produces irrotational flow.

**Pressure.** Since the flow is irrotational and steady, we can apply the Bernoulli equation at two points not located on the same streamline.