Assignment 8

The due date for submitting this assignment has passed. As a result, any comments on questions will be delayed.

1. For a 2D steady laminar incompressible flow, the equation for stream function is

\[ \psi = \frac{1}{2} \left( u^2 + v^2 \right) \]

2. For a 2D steady laminar incompressible flow, the equation for vorticity is

\[ \omega = \frac{1}{2} \left( \frac{\partial u}{\partial y} - \frac{\partial v}{\partial x} \right) \]

3. For the figure above, the downstream equation at the hot wall is given as

\[ u = 0, \quad v = 0 \]

4. The boundary condition for stream function and vorticity for the bottom wall as shown in the figure below is

\[ \psi = 0, \quad \omega = 0 \]

5. For the figure above, the solution of stream function at point 10 is

\[ \psi = \frac{1}{2} \left( u^2 + v^2 \right) \]

6. For the figure above, the solution of vorticity at point 10 is

\[ \omega = \frac{1}{2} \left( \frac{\partial u}{\partial y} - \frac{\partial v}{\partial x} \right) \]

7. For the figure above, the solution of stream function at point 10 is

\[ \psi = 0 \]

8. For the vorticity stream function method, the wall can be considered as a streamline.