

$$1) \theta = \pi/2 \Rightarrow \sin \theta = 1, \cos \theta = 0$$

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$$1) u_r = \frac{1}{r} \frac{\partial \psi}{\partial r} = 0 \Rightarrow \frac{\partial \psi}{\partial r} = 0$$

$$2) \psi = 3.5 \left(\frac{r}{0.09} - r \right) \sin \theta - 1.2 \ln r$$

$$\text{and } \theta = \frac{3\pi}{10}$$

$$\frac{1}{r} \left(3 \cos \theta + \frac{\pi}{10} \right) = 0, u_\theta = 3 \sin \theta = 0$$

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ii) At the stagnation points

$$\text{Contour line } \psi = 3y + 1.0 \tan^{-1} \left(\frac{y}{x} \right)$$

$$5) a) \psi = 3r \sin \theta + 1.0 \theta$$