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Test the Cylinder Boundary Condition

The cylinder boundary condition on the scalar vorticity may be rewritten in terms of the stream function as

$$\left. \frac{\partial^2 \psi}{\partial \xi^2} \right|_{(1,j)} = \frac{1}{2h^2} (8\psi_{2,j} - \psi_{3,j}).$$

This boundary condition was derived using

$$\psi_{1,j} = 0, \quad \left. \frac{\partial \psi}{\partial \xi} \right|_{(1,j)} = 0.$$

A stream function that is quadratic in ξ near the cylinder surface satisfies the above two conditions. Use it to test the validity of the derived boundary condition.

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