Problem 1B.2

A fluid in a state of rigid rotation.

(a) Verify that the velocity distribution (c) in Problem 1B.1 describes a fluid in a state of pure rotation; that is, the fluid is rotating like a rigid body. What is the angular velocity of rotation?

(b) For that flow pattern evaluate the symmetric and antisymmetric combinations of velocity derivatives:

(i) $(\partial v_y/\partial x) + (\partial v_x/\partial y)$

(ii) $(\partial v_y/\partial x) - (\partial v_x/\partial y)$

(c) Discuss the results of (b) in connection with the development in §1.2.