

### Problem 115J

For each of the three flows [A], [B], and [C] described below answer the following questions:

- (1) Find the form of the streamlines and make a sketch illustrating them.
- (2) Find the vorticity.

The flows are:

[A] Stagnation point flow given by:

$$(u, v, w) = (kx, -ky, 0)$$

[B] Free vortex flow:

$$(u_r, u_\theta, u_z) = \left(0, -\frac{\Gamma}{2\pi r}, 0\right)$$

[C] Solid body rotation:

$$(u_r, u_\theta, u_z) = (0, \Omega r, 0)$$