Homework #8 • MATH 462 • Vortex Dynamics

- submit your write-up noon, Thursday 23 March.

A) Trapped Vortices? (3 pages + plot, 10pts) This problem is based on #5.12 in Acheson. Apply the Helmholtz rule for vortex line motion to obtain the coupled ODEs for the complex-valued positions $z_1(t)$ and $z_2(t)$. Verify the given solution, then plot the implied steady stream-function and show that it recovers Figure 5.19b.

Bonus: Investigate the parenthetical remark at the end of the question in Acheson by using an ODE solver to determine the stability of the configuration.

B) Ring of Vortices (2 pages, 10pts) Solve the problem as posed by #5.14 in Acheson. Presentation and design of notation will be part of the grading.

Extra: Is this configuration stable?