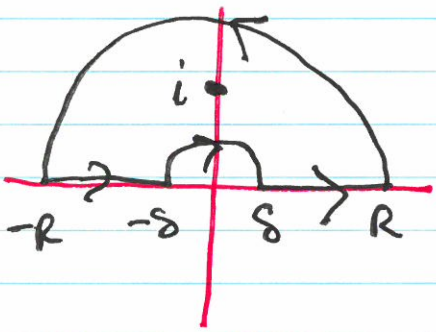
MATH 3401/3901 Lecture 1

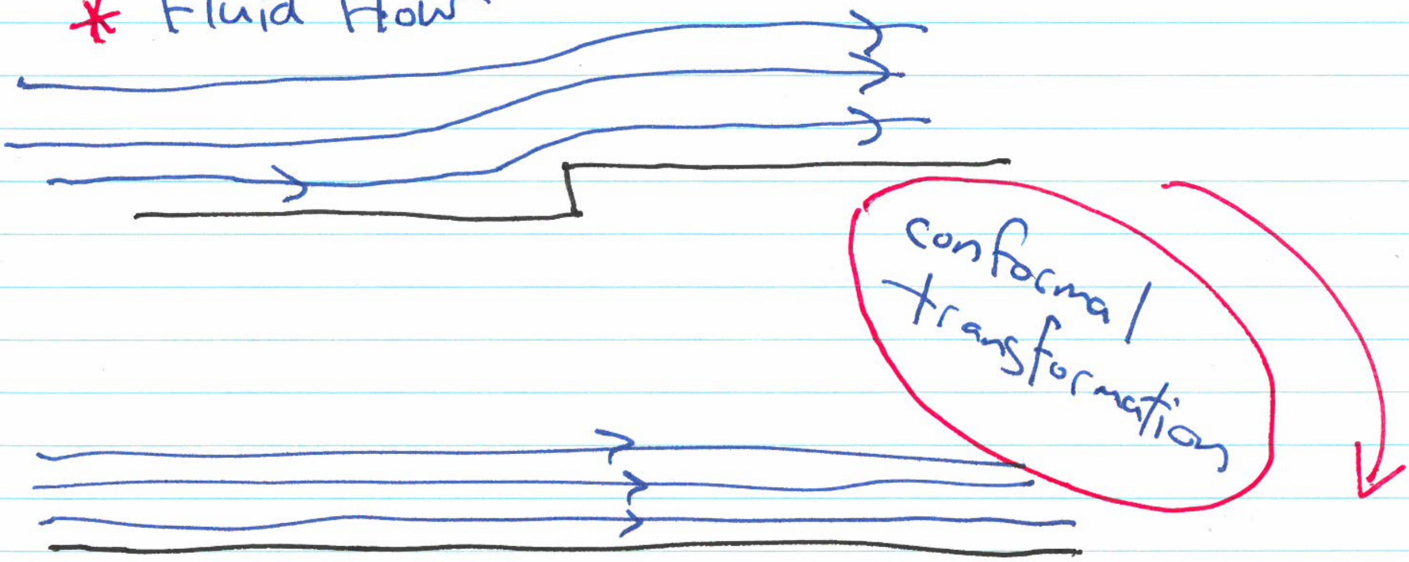
* $e^{i\pi} = -1$
* $\int_0^\infty \frac{\sin x}{x}\,dx = \frac{\pi}{2}$

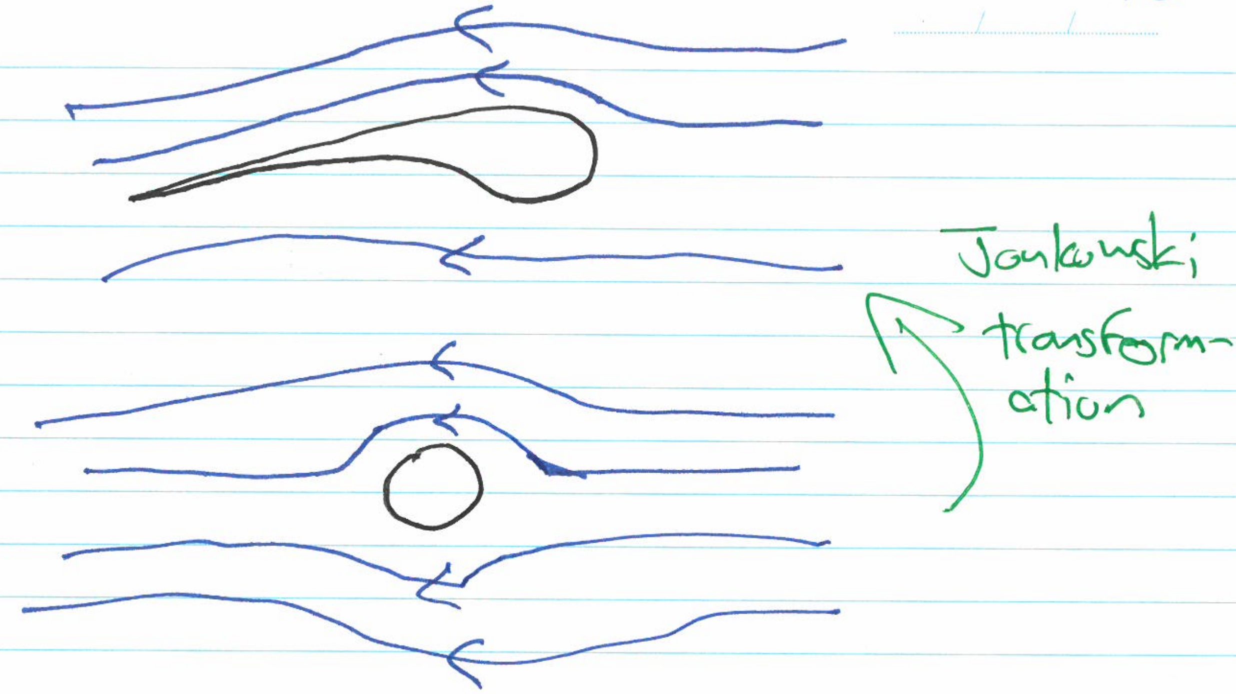
recall $\int_0^1 \frac{dx}{x} \left(= \lim_{\varepsilon \to 0^+} \int_\varepsilon^1 \frac{dx}{x} \right)$
diverges (p test, $p \geq 1$), &
$\int_1^\infty \frac{dx}{x} = \lim_{M \to \infty} \int_1^M \frac{dx}{x}$, also diverges
(p test). Infact the integral converges



Can evaluate the integral using complex analysis methods: contour integration.

* Fluid flow




Joukowski
transform-
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