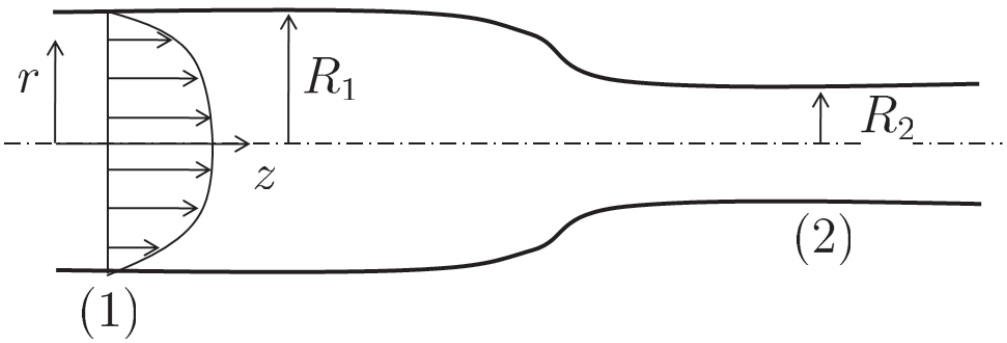
MIT Department of Mechanical Engineering

2.25 Advanced Fluid Mechanics

Problem 10.05

This problem is from "Advanced Fluid Mechanics Problems" by 2.25 Problem Set Solution — Problem



An inviscid, incompressible fluid flows steadily through a circular pipe with a contraction. At the entrance section, the velocity is purely in the axial direction and is given by :

$$u_1(r) = V_o \left(1 - \left(\frac{r}{R_1}\right)^2\right)$$

(a) What does the vorticity field look like at the entrance section?

(b) What is the velocity profile at the exit?

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