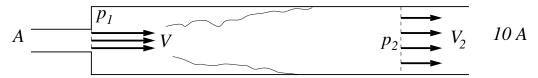F7.   A pipe of cross-sectional area A suddenly increases to an area of $10\,A$. The air velocity in the pipe is V, and the pressure at station 1 is p_1. After undergoing mixing in the larger pipe, the velocity becomes uniform again at station 2, where the velocity is V_2, and the pressure is p_2. Assume the density ρ is constant everywhere (low speed flow). Be sure to clearly draw the control volume you will be using.

a) Determine the velocity V_2.
b) Determine the pressure difference $p_2 - p_1$.