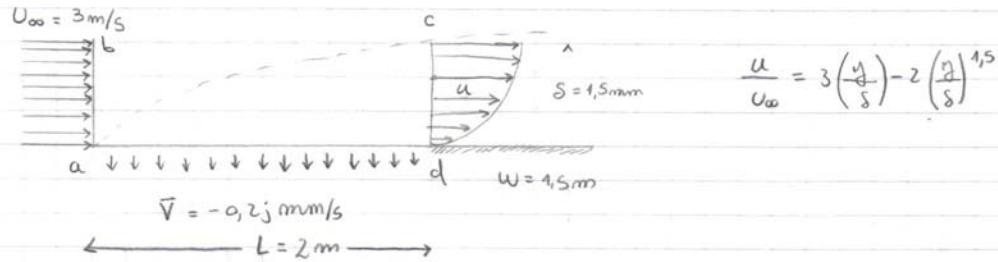


# PAUTA PROBLEMA 1, EJERCICIO 3



SOL:

$$\frac{\partial}{\partial t} \int_{V_c} \rho dV + \int_{S_c} \rho \vec{V} d\vec{A} = 0 \Rightarrow \int_{S_c} \rho \vec{V} d\vec{A} = 0$$

(FLUJO PERMANENTE)

$$\Rightarrow \int_{S_{ab}} \rho \vec{V} d\vec{A} + \int_{S_{bc}} \rho \vec{V} d\vec{A} + \int_{S_{cd}} \rho \vec{V} d\vec{A} + \int_{S_{ad}} \rho \vec{V} d\vec{A} = 0$$

$$\Rightarrow -\rho \cdot U_{\infty} \cdot S \cdot W + \dot{m}_{bc} + \rho U \int_0^W \int_0^S \left( 3\left(\frac{y}{S}\right) - 2\left(\frac{y}{S}\right)^{1.5} \right) dy dz + \rho \cdot V \cdot L \cdot W = 0$$

$$\Rightarrow \dot{m}_{bc} = \rho U_{\infty} S W - \rho V L W - U \rho \left( \frac{3}{S} \cdot \frac{S^2}{2} - \frac{2}{S^{1.5}} \cdot \frac{S^{2.5}}{2.5} \right)$$

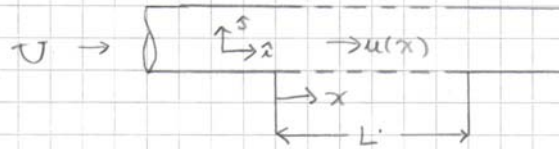
$$\Rightarrow \dot{m}_{bc} = 6.75 - 0.6 - 4.5 \left( 0.00225 - 0.0012 \right) \cdot 1000$$

$$\Rightarrow \dot{m}_{bc} = 6.75 - 0.6 - 4.725 \Rightarrow \boxed{\dot{m}_{bc} = 1.425 \text{ kg/s}}$$

$\therefore$  SALEN  $1.425 \frac{\text{kg}}{\text{s}}$  POR LA SECCIÓN b-c

PAUTA PROBLEMA 2, EJERCICIO 3

$\rho$  constante, fluido no viscoso en ducto



$$L = 0,3 \text{ [m]}$$

$$U = 5 \text{ [m/s]}$$

$$u(x) = U(1 - x/2L)$$

Encontrar una expresión para la aceleración a lo largo de L

$$a_{px} = u \frac{\partial u}{\partial x} + v \frac{\partial u}{\partial y} + w \frac{\partial u}{\partial z} + \frac{\partial u}{\partial t}$$

Suposiciones

- (1) flujo permanente
- (2) incompresible no viscoso

$$(1) \Rightarrow \frac{\partial u}{\partial t} = 0$$

$$(2) \Rightarrow v = w = 0$$

luego

$$a_{px} = u \frac{\partial u}{\partial x} = U \left(1 - \frac{x}{2L}\right) U \left(-\frac{1}{2L}\right)$$

$$a_{px} = -\frac{U^2}{2L} \left(1 - \frac{x}{2L}\right)$$

Evaluando

$$\bar{a}_p = -41,66 \left(1 - \frac{x}{0,6}\right) \hat{x} \text{ [m/s}^2\text{]}$$