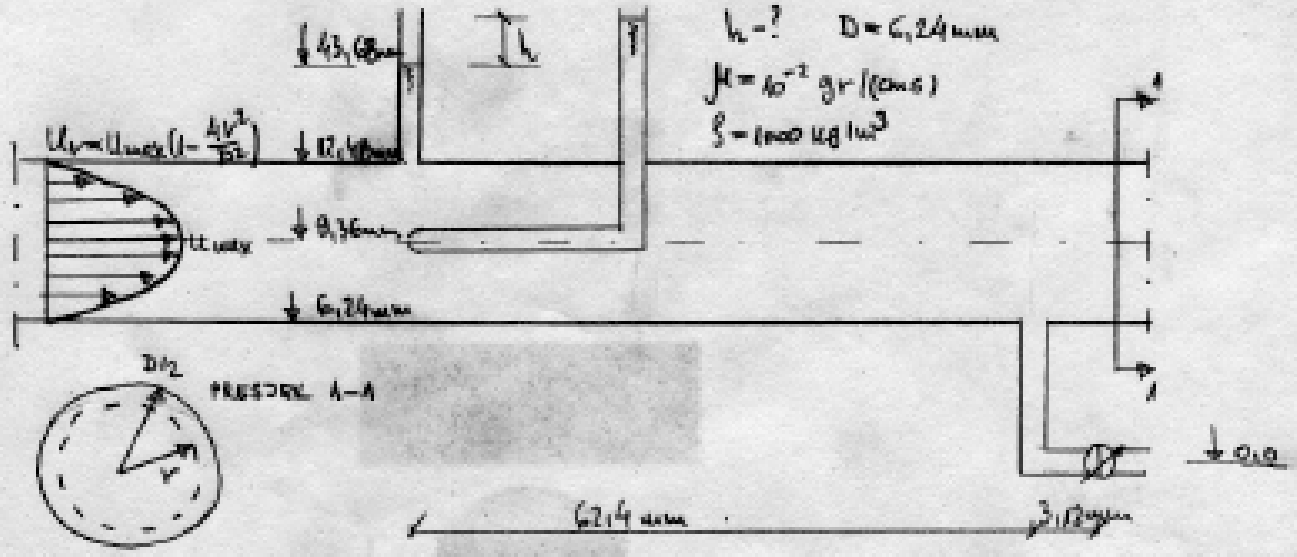

a)

USTALJENO I LAMINARNO TEČENJE $V_{sr} = \frac{Q}{A} = 1,008 \text{ m}^3/\text{s} = 26,2 \text{ m}^3/\text{s}$ $V_{sr} = 0,0262 \text{ m/s}$

$$Q = \int_A u \, dA = \int_0^{D/2} u_r \, 2r\pi \, dr = \int_0^{D/2} u_{max}\left(1 - \frac{4r^2}{D^2}\right) \cdot 2r\pi \, dr \qquad u_{max} - ?$$

$$Q = V_{sr} A = V_{sr} \cdot \left(\frac{D}{2}\right)^2 \pi = 8,008 \cdot 10^{-7} \text{ m}^3/\text{s} = 8,008 \cdot 10^{-4} \frac{l}{s} \qquad \boxed{Q = 8,008 \cdot 10^{-4} \frac{l}{s}}$$

$$Q = u_{max} \cdot 2 \cdot \pi \int_0^{D/2} \left(1 - \frac{4r^2}{D^2}\right) r \, dr \qquad Q = 2\pi u_{max} \int_0^{D/2} \left(r - \frac{4r^3}{D^2}\right) dr$$

$$Q = 2\pi u_{max} \left(\frac{r^2}{2}\Big|_0^{D/2} - \frac{4}{D^2} \cdot \frac{r^4}{4} \Big|_0^{D/2} \right) \qquad Q = 2\pi u_{max} \left[\frac{(D/2)^2}{2} - \frac{(D/2)^4}{D^2} \right]$$

$$\boxed{u_{max} = 0,052 \text{ m/s}}$$

$$\mu = 10^{-2} \frac{g}{cm\,s} = 10^{-2} \cdot \frac{0,001 \text{ kg}}{0,01 \text{ m s}} \qquad \mu = 10^{-3} \frac{kg}{m\,s}$$

$$Re = \frac{\rho D V_{sr}}{\mu} \qquad Re = 163,488 \text{ pretpostavka je ok}$$

b) $h = \Pi_p - \Pi_o = \frac{u_{max}^2}{2g}$ $\boxed{h = 1,38 \cdot 10^{-4} \text{ m}}$

$$\frac{p_H}{\rho g} = \Pi_H \qquad p_H = \Pi_H \cdot \rho g \qquad \Pi_o + \frac{V_{sr}^2}{2g} = \Pi_H + \frac{V_{sr}^2}{2g} + \lambda \frac{L}{D} \frac{V_{sr}^2}{2g}$$

$$\Pi_H = \Pi_o - \lambda \frac{L}{D} \frac{V_{sr}^2}{2g} \qquad \lambda - ?$$

$$\lambda = \frac{64}{Re} \qquad \lambda = \frac{64}{163,488} \qquad \lambda = 0,391 \qquad L = 10 D = 62.4 \text{ mm}$$

$$\Pi_H = 43,68 \cdot 10^{-3} - 0,391 \cdot \frac{62,4 \cdot 10^{-3}}{6,24 \cdot 10^{-3}} \cdot \frac{0,0262^2}{2 \cdot 9,81} = 0,043544 \text{ m}$$

$$\boxed{p_H = 427,16 \text{ Pa}}$$

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