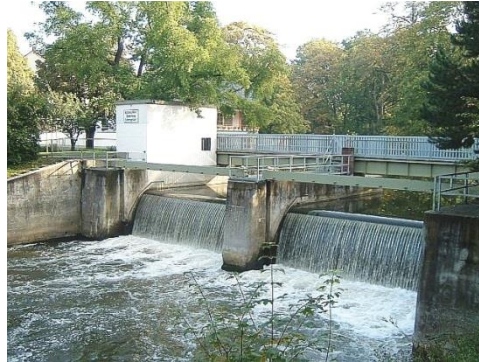
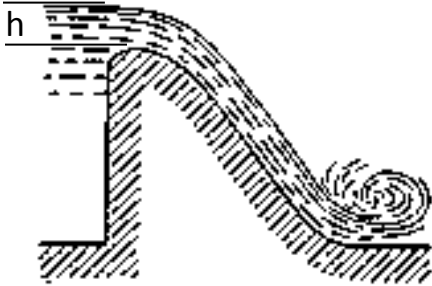
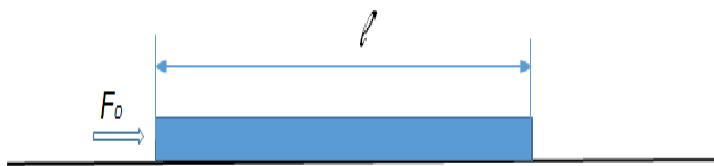


1. A long cylinder of radius R_1 is displaced along its axis with a constant velocity v_0 inside a stationary co-axial cylinder of radius R_2 . The space between the cylinders is filled with liquid with the viscosity coefficient η . Find the velocity of the liquid as a function of the distance from the axis of the cylinders and the friction force per unit length of the inner cylinder.
2. Water flows over a weir. Using dimensional analysis, find the dependence of the flow rate per unit width of the crest on the height of head of water over the crest, h . Note that because the Reynolds number of the flow is very large, the flow parameters are independent of viscosity.



3. A wire of diameter d and length l is stretched horizontally. If a weight of mass m is suspended from the middle point of the wire, what is the resulting descent of the middle point, h ? The proper weight of the wire could be neglected. Young's modulus of the wire is Y . Assume that $h \ll l$.
4. A spherical vessel with the radius R and the wall thickness $d \ll R$ is filled with a gas at the pressure $p \gg p_{\text{atm}}$. Find the stress in the vessel?

5. מוט אחיד בעל אורך l ושטח חתך S עשוי מחומר עם מודול יאנג Y נעה על גבי שולחן בלי חיכוך בהשפעה של הכוח F_0 הפועל על הצד של המוט כמתואר באיור. מצא את התפלגות המאמץ לאורך המוט וההתקצרות היחסית שלו, δ/l . (20 נק')



6. Two identical steel rods collide with equal velocities v as it is shown in figure. Find the collision time if the length of rods is 10 cm. At what velocities plastic deformations arise? Density of steel is 7.8 g/cm^3 , Young's modulus $2 \cdot 10^{11} \text{ Pa}$, the elastic limit $2 \cdot 10^8 \text{ Pa}$.

