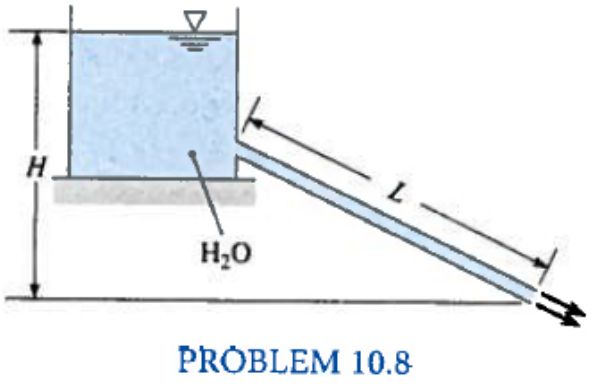
CE 3305 Engineering Fluid Mechanics
Exercise Set 19
Summer 2018 – GERMANY

1. (Problem 10-8 pg 395) Figure 1 is a schematic of water (15^oC) flowing from a tank through a tube and discharging into ambient conditions (a jet at the outlet). The tube has an inside diameter of 8 mm and a length of L=6m, and the frictional resistance coefficient is f=0.015. Assuming the only head loss in in the tube, find
   (a) The exit velocity in m/s if the water level is H=3m.
   (b) The discharge in L/s.
   (c) Sketch the HGL and the EGL.



PROBLEM 10.8

Figure 1: Tank draining through a tube.

2. (Problem 10-63 pg 400) Figure 2 is a schematic of a pumped-storage system. If a flow of 0.10 m^3/s of water is to be maintained in the system shown, what power must be added to the water by the pump? The pipe is made of steel and is 15 cm in diameter.

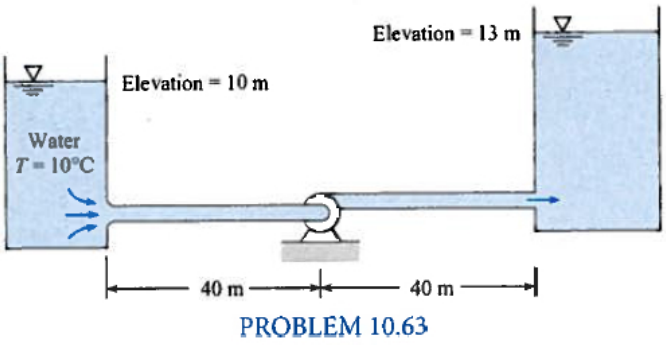


Figure 2: Pump-storage system