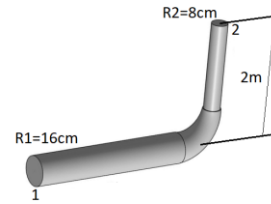## Tutorial 5 : Elementary Fluid Dynamics 2

1. Water flows through a pipe at a flow rate of 80 liters/second. If the pressure at point 1 is 180 kPa, find the velocity at point 1 and the velocity and pressure at point 2.

2. A boat hits a stone, creating a hole with an area of 20 cm^2. Calculate the water flow into the ship if the hole is 1.5 m underwater.

3. Air (γ_{air} =12 N/m^3) flows through a pipe with decreasing cross-sectional area. The density of the manometric fluid is 827 kg/m^3. If pressure losses are neglected, calculate the volume flow rate in l/s.
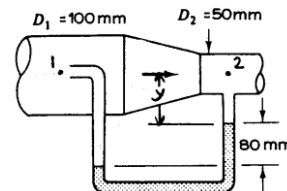
4. A venturi tube generates low pressure at the throat to extract fluid from the tank. Find the expression for the velocity v$_2$ at the outlet sufficient to absorb the liquid in point 1.
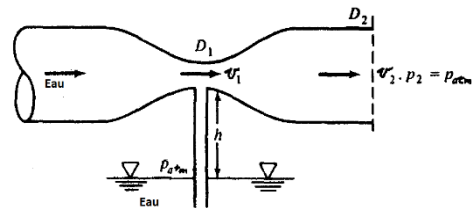
5. If losses are neglected, find the volume flow rate through the venturi tube shown in the figure.
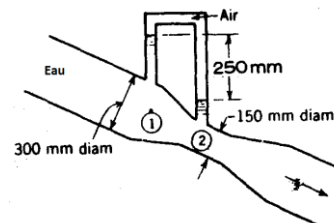
6. The valve of the exposed cylindrical tank suddenly opens. The valve is located at a distance H from the free surface of the water, the area of the tank is S$_R$, and the area of the valve is S$_V$. Calculate the time to empty the tank. We assume that S$_V$/S$_R$ >> 1.