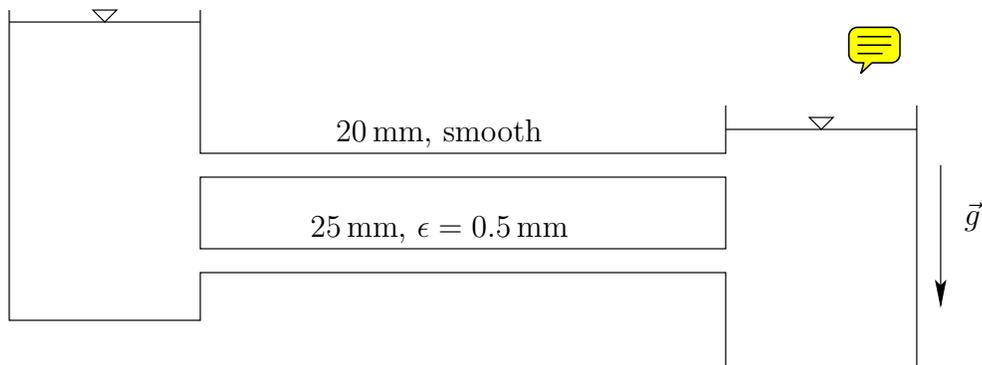


- (20) 4. Two large water ($\nu = 10^{-6} \text{ m}^2/\text{s}$) reservoirs are joined by two equal-length pipes as shown. The 25 mm diameter pipe has a roughness of 0.5 mm while the 20 mm diameter pipe is smooth. The flow rates through the two pipes are equal. What is the total flow rate between the two reservoirs? Neglect minor losses.



- (20) 5. A 20 cm diameter circular cylinder is immersed in a 40 m/s freestream and is producing lift. The flow can be approximated as inviscid. There is only one stagnation point on the cylinder surface. Determine the lift force. Determine the maximum pressure difference between any two points on the surface of the cylinder. Where are these two points? Let the air density be 1.2 kg/m^3 .

