

1. Suppose that glycerin is flowing ($T = 20^\circ\text{C}$) and that the pressure gradient dp/dx is $-1.6\text{kN}/\text{m}^3$. What are the velocity and shear stress at a distance of 12mm from the wall if the space B between the walls is 5.0cm ? What are the shear stress and velocity at the wall? The velocity distribution for viscous flow between stationary plates is

$$u = -\frac{1}{2\mu} \frac{dp}{dx} (By - y^2)$$

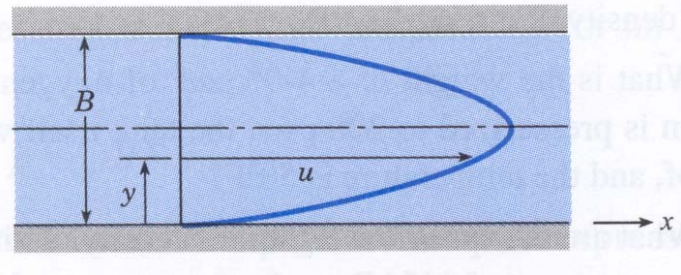


Figure 1 (for Problem 1)

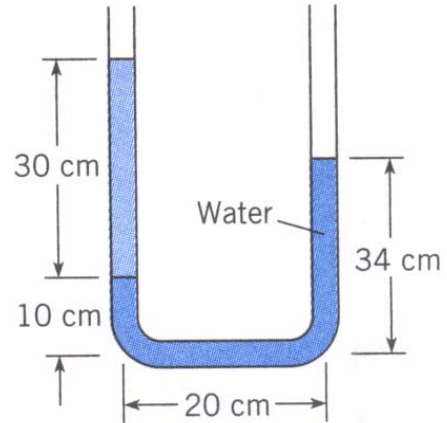


Figure 2 (for Problem 2)

2. What is the specific gravity of the liquid in the left leg of the manometer tube?

3. Neglecting the weight of the gate, determine the force acting on the hinge of the gate.

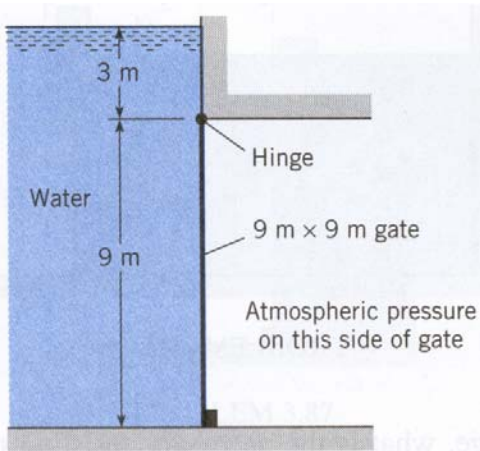


Figure 3 (for Problem 3)

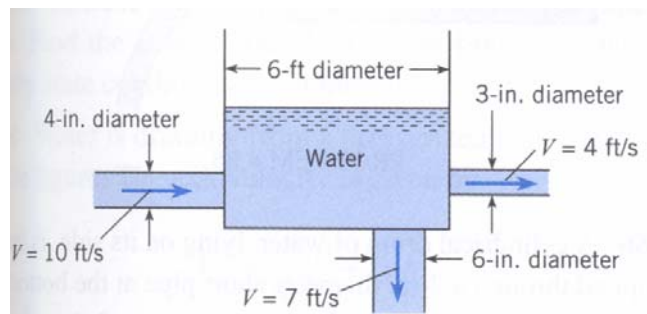


Figure 4 (for Problem 4)

4. Is the tank in the figure filling or emptying? At what rate is the water level rising or falling in the tank?