August-November 2017

1. Review of Tutorial 1

2. Gate *AB* is 1.5 m wide into the paper and opens to let fresh water out when the ocean tide is dropping. The hinge at *A* is 0.6 m above the freshwater level. At what ocean level *h* will the gate first open? Neglect the gate weight.

P2.73
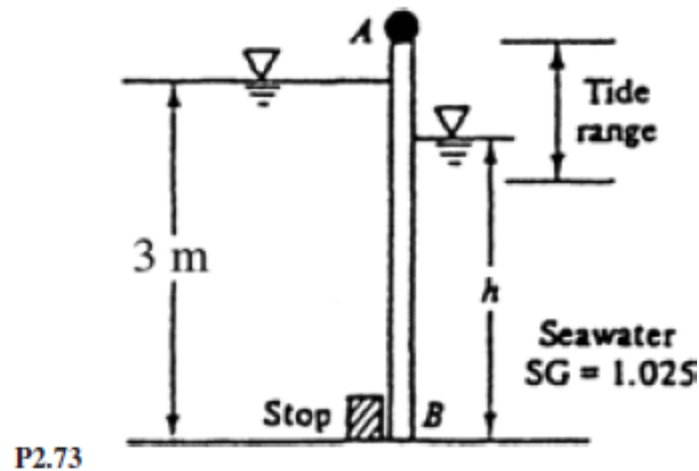
3. Gate *AB* has length *L* and width *b* into the paper, is hinged at *B*, and has negligible weight. The liquid level *h* remains at the top of the gate for any angle θ. Find an analytic expression for the force *P*, perpendicular to *AB*, required to keep the gate in equilibrium in Fig. P2.59.

P2.59
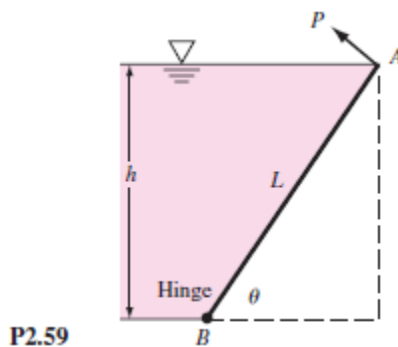
4. Gate *AB* in Fig. P2.61 is a homogenous mass of 180 kg, 1.2 m wide into the paper, hinged at *A*, and resting on a smooth bottom at *B*. All fluids are at 20°C. For what water depth *h* will the force at point *B* be zero?

P2.61
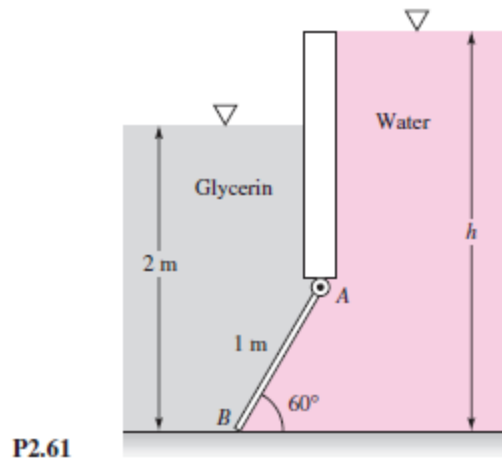
5. Find an analytic formula for the vertical and horizontal forces on each of the semicircular panels *AB* in Fig. P2.94. The width into the paper is *b*. Which force is larger? Why?

P2.94