To do ...

- Quiz 7 next week
- WA 4 due **TODAY**
- HW 25 ME due **Sat**
- HW 24 PL due **Tues**

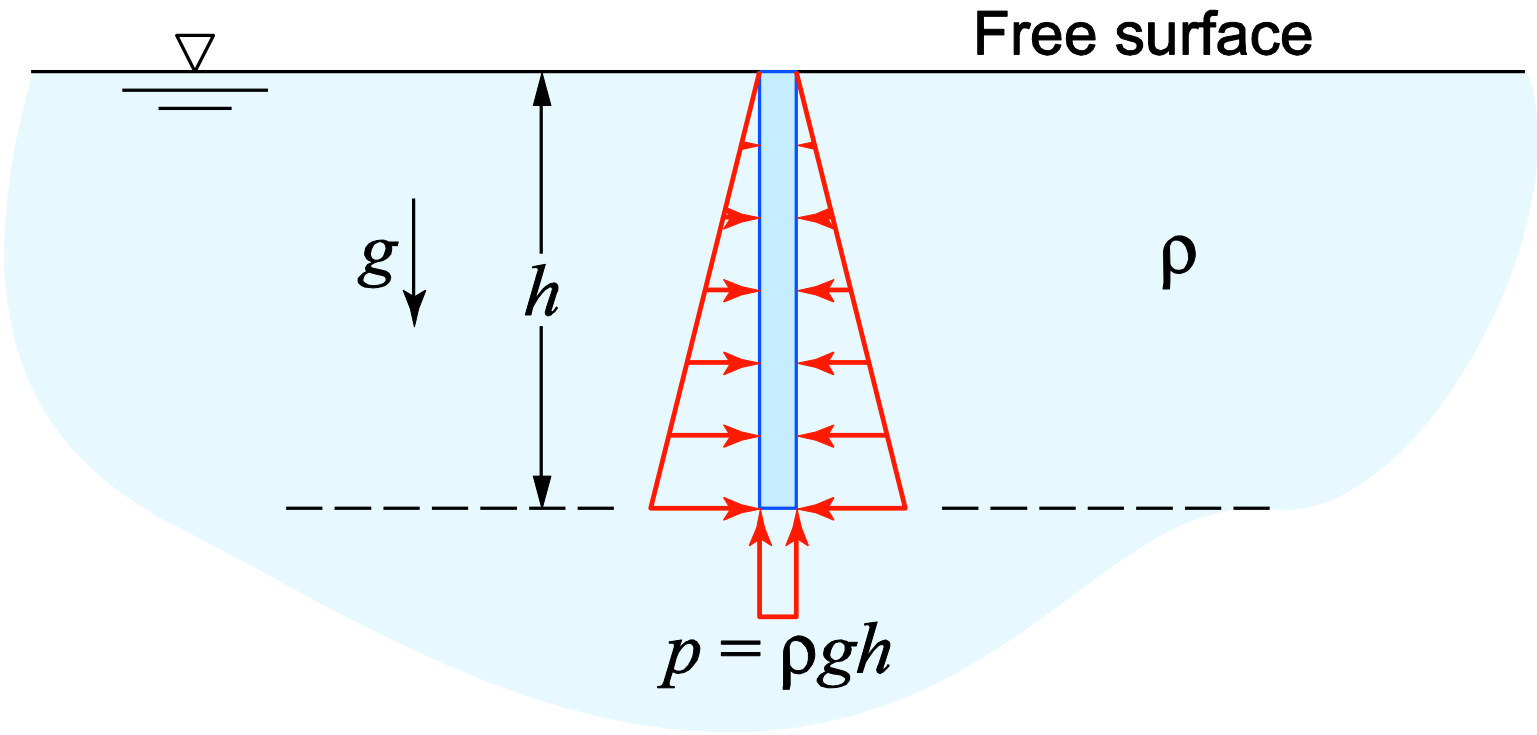
Fluids

Pascal's law: A fluid at rest creates a pressure p at a point that is the ***same*** in ***all*** directions

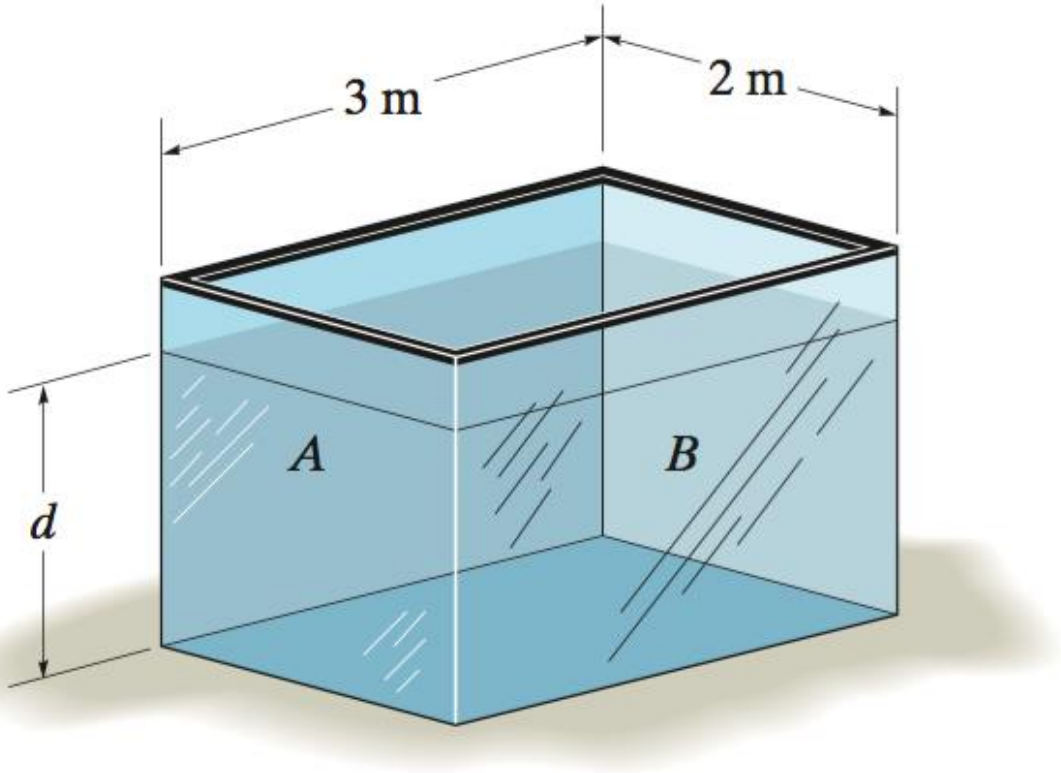
Incompressible: An incompressible fluid is one for which the mass density ρ is independent of the pressure p. Liquids are generally considered incompressible. Gases are compressible, but may be approximated as incompressible if the pressure variations are relatively small.

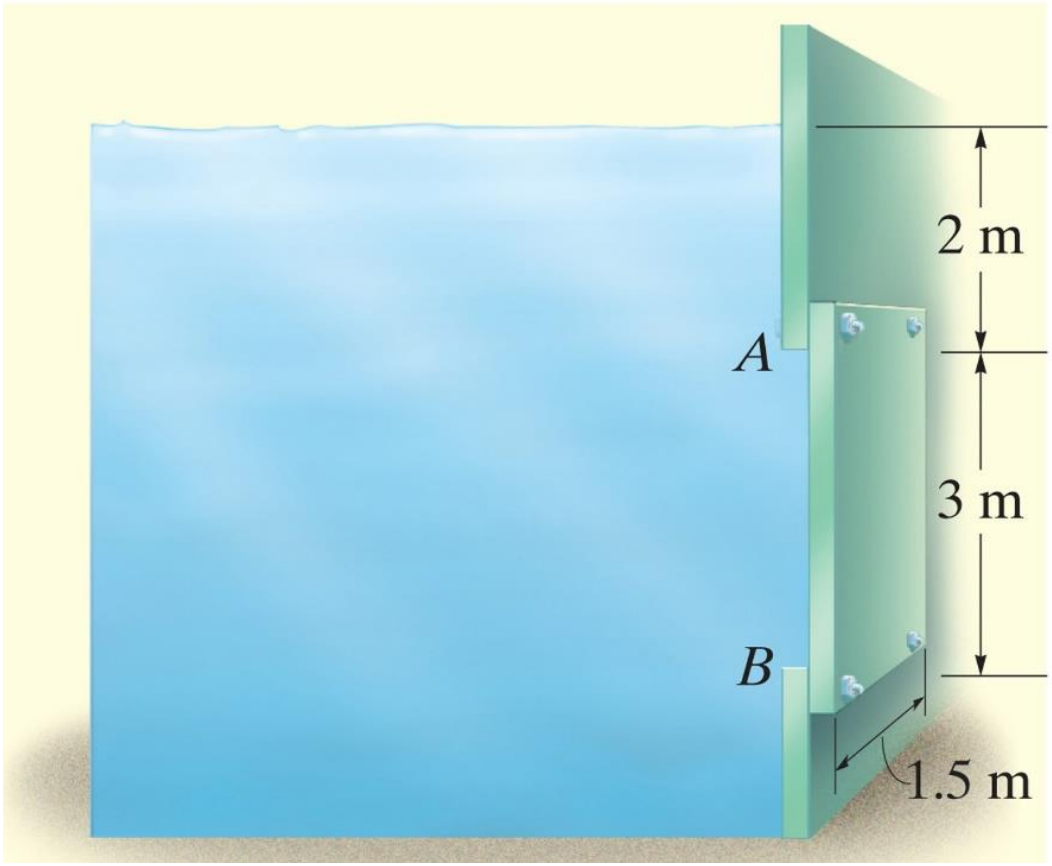
Recap: Fluid Pressure

For an incompressible fluid at rest with mass density , the pressure varies linearly with depth z, and is *constant* along any horizontal plane (since h is constant):

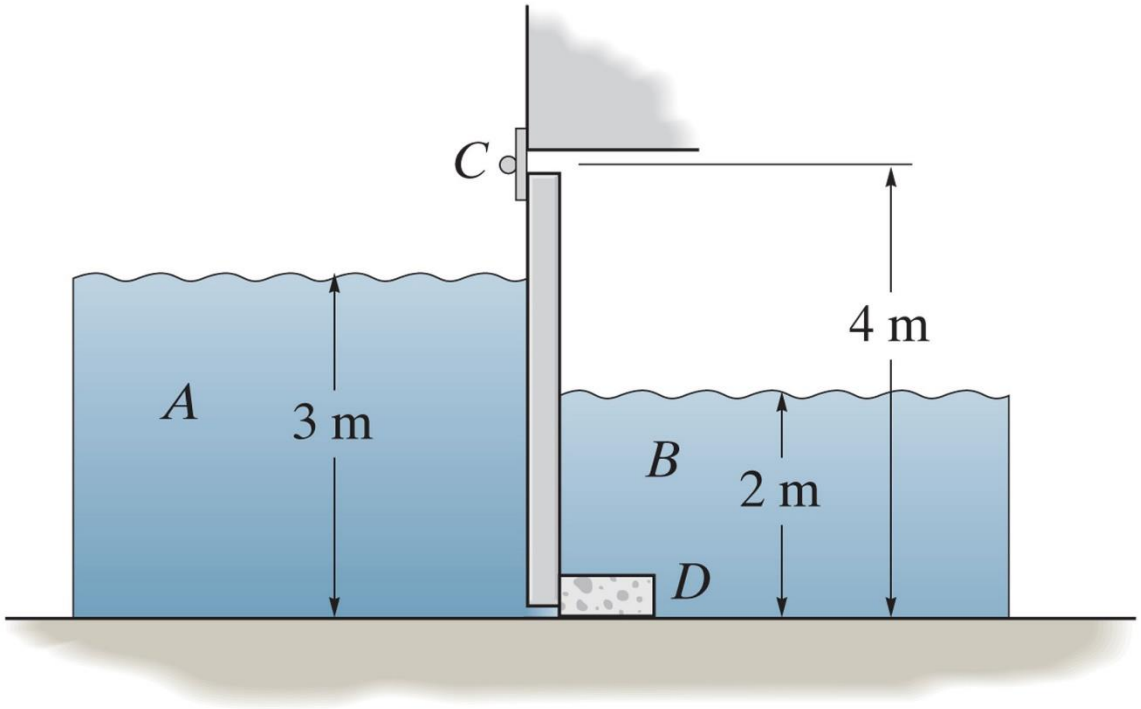


The tank is filled with water to a depth of $d = 4$ m. Determine the resultant force the water exerts on side A of the tank. ($\rho = 1000$ kg/m^3)





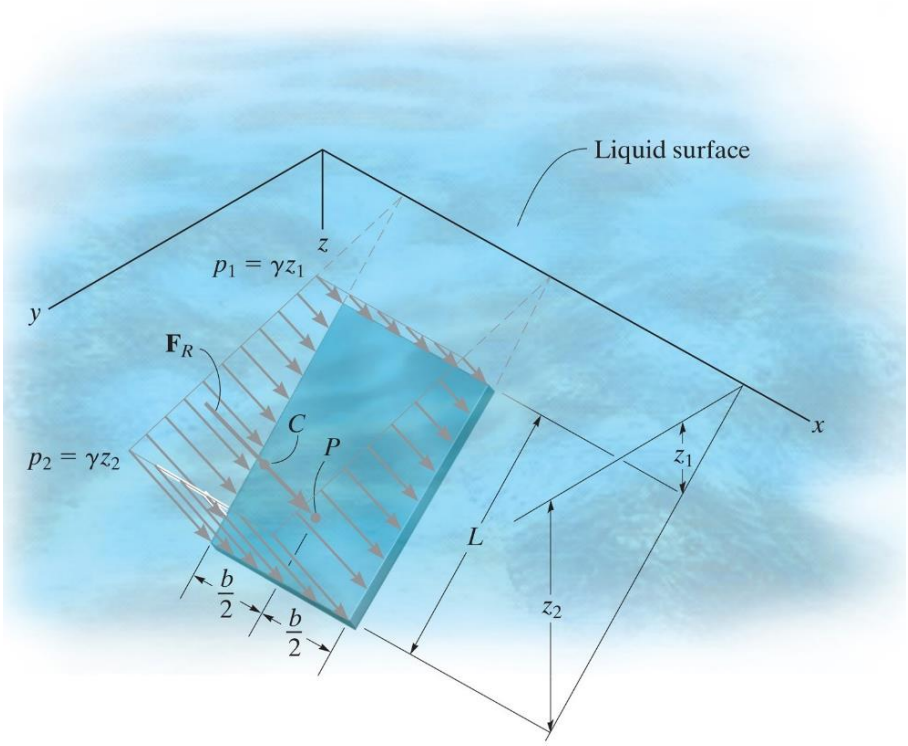
Determine the magnitude and location of the resultant hydrostatic force acting on the submerged rectangular plate *AB*. The plate has width 1.5m. The density of the water is 1000 kg/m^3

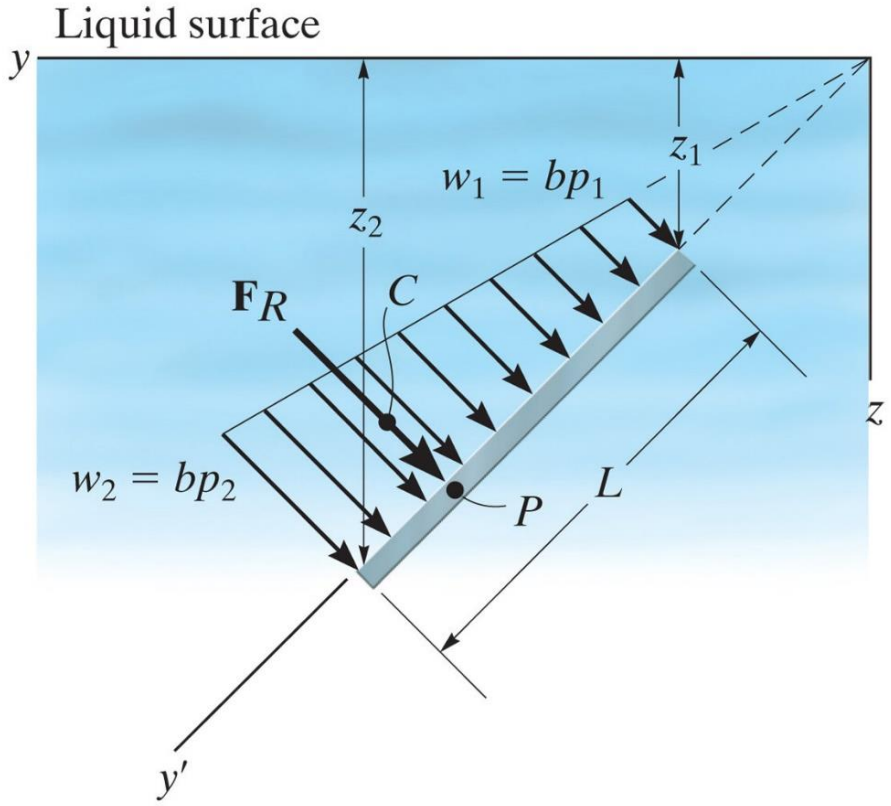


For the condition of high tide shown, determine the reactions developed at the hinge C and stop block. The length of the gate is 6 m and its height is 4 m. The density of the water is 1000 kg/m^3

Fluid Pressure

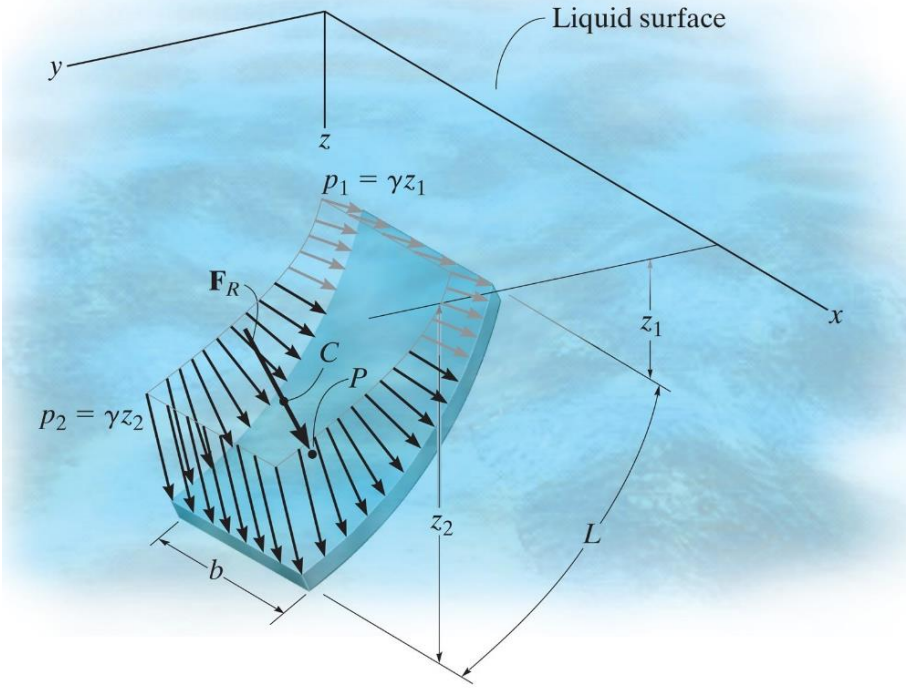
For an incompressible fluid at rest with mass density , the pressure varies linearly with depth z

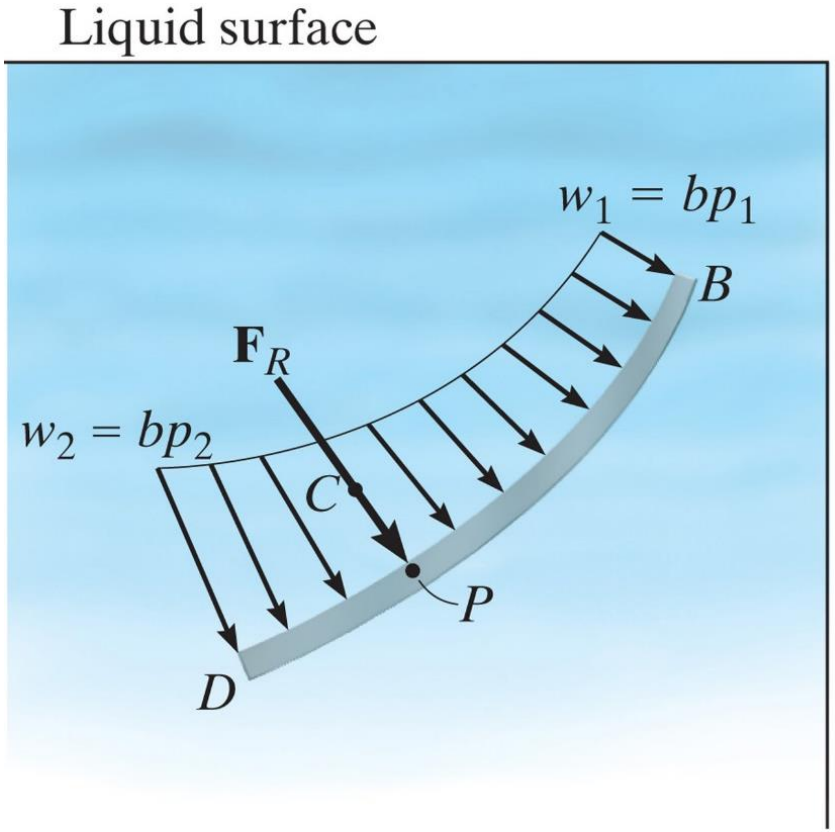


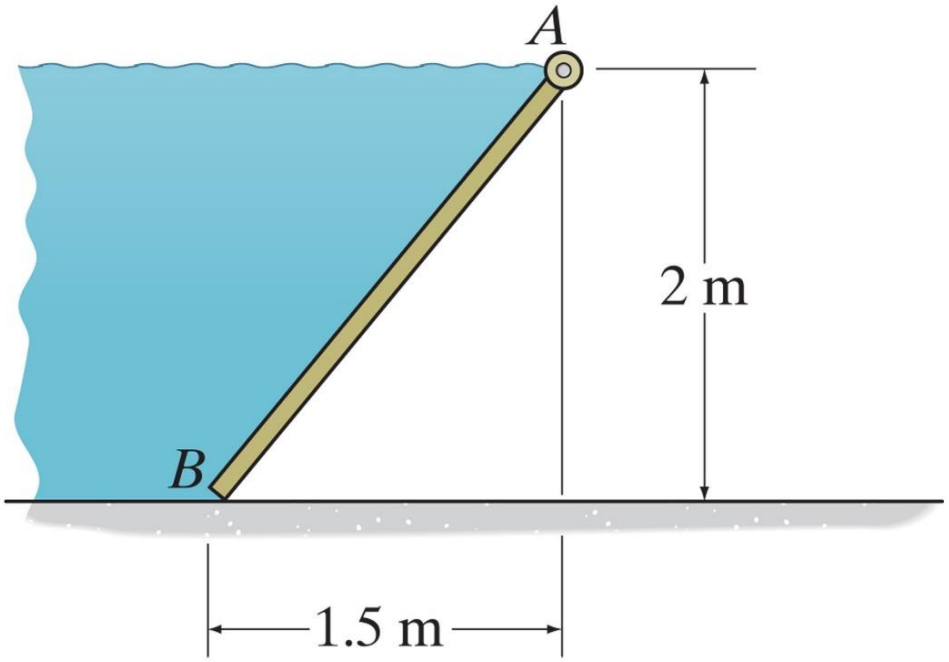


Fluid Pressure

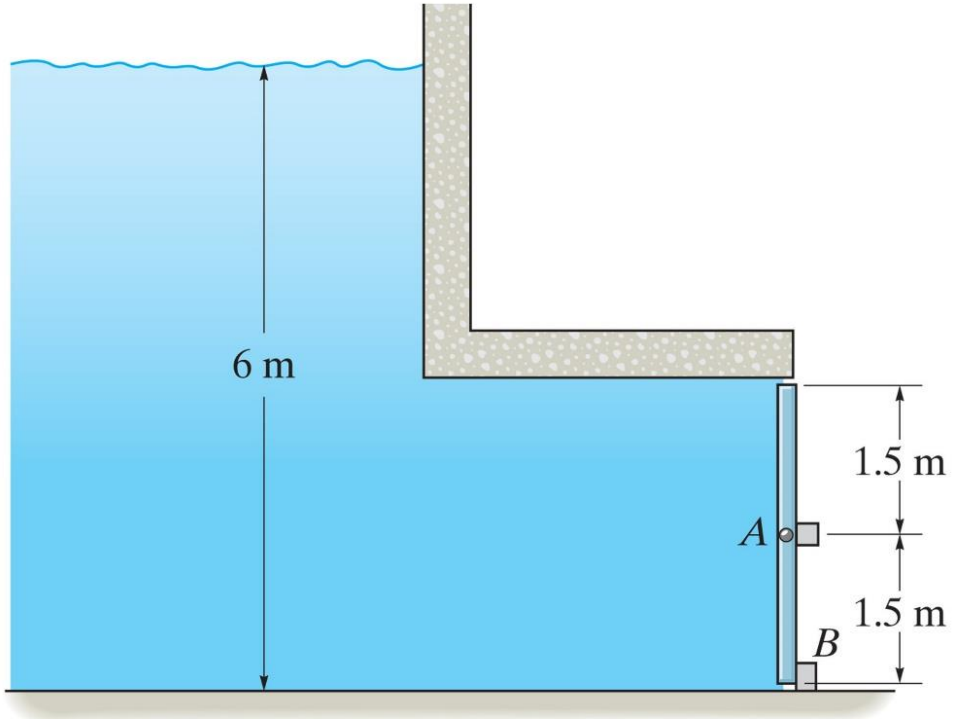
For an incompressible fluid at rest with mass density , the pressure varies linearly with depth z







Determine the magnitude of the hydrostatic force acting on gate AB which has a width of 1.5 m.



The 2-m-wide rectangular gate is pinned at its center A and is prevented from rotating by the block at B. Determine the reactions at these supports due to hydrostatic pressure.