3–63 A cylindrical tank is fully filled with water (Fig. P3–63). In order to increase the flow from the tank, an additional pressure is applied to the water surface by a compressor. For $P_0 = 0$, $P_0 = 5$ bar, and $P_0 = 10$ bar, calculate the hydrostatic force on the surface A exerted by water.

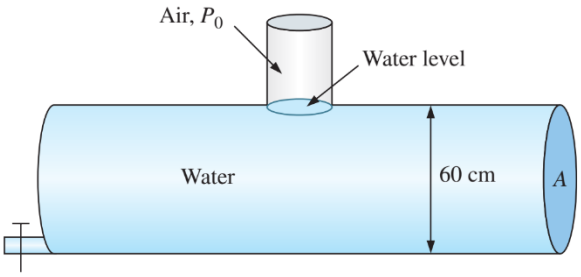

FIGURE P3–63

3–69 Determine the resultant force acting on the 0.7-m-high and 0.7-m-wide triangular gate shown in Fig. P3–69 and its line of action.

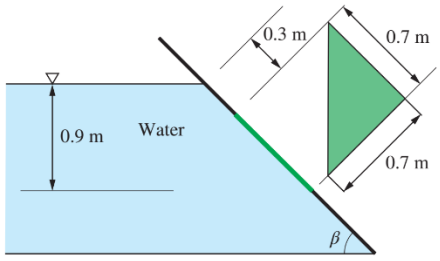

FIGURE P3–69

3–70 A 6-m-high, 5-m-wide rectangular plate blocks the end of a 5-m-deep freshwater channel, as shown in Fig. P3–70. The plate is hinged about a horizontal axis along its upper edge through a point A and is restrained from opening by a fixed ridge at point B. Determine the force exerted on the plate by the ridge.

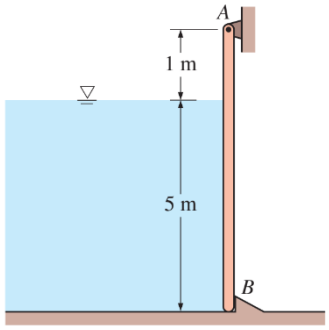

FIGURE P3–70

3–74 For a gate width of 2 m into the paper (Fig. P3–74), determine the force required to hold the gate ABC at its location. *Answer:* 17.8 kN

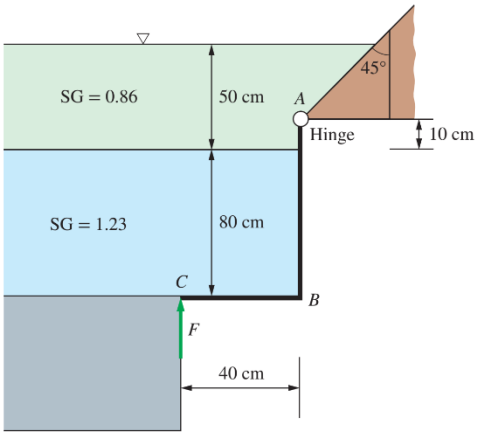

FIGURE P3–74

3–81 Gate AB (0.6-m × 0.9-m) is located at the bottom of a tank filled with methyl alcohol (SG = 0.79), and hinged along its bottom edge A. Knowing that the weight of the gate is 300 N, determine the minimum force that must be applied to the cable (BCD) to open the gate.