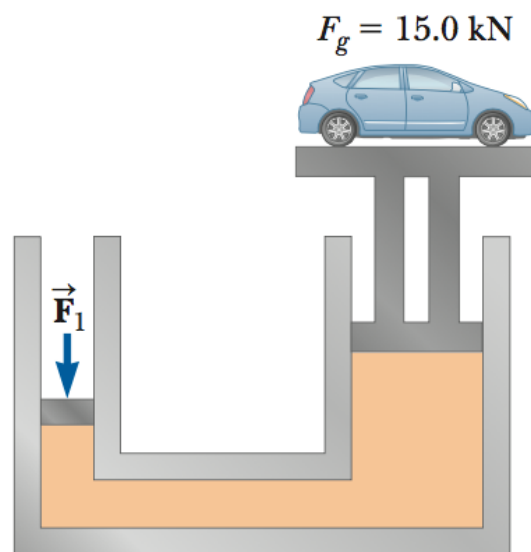


(From the course textbook 8th edition)

- 3. Q/C** A 50.0-kg woman wearing high-heeled shoes is invited into a home in which the kitchen has vinyl floor covering. The heel on each shoe is circular and has a radius of 0.500 cm. (a) If the woman balances on one heel, what pressure does she exert on the floor? (b) Should the homeowner be concerned? Explain your answer.
- 6.** A swimming pool has dimensions 30.0 m  $\times$  10.0 m and a flat bottom. When the pool is filled to a depth of 2.00 m with fresh water, what is the force exerted by the water on (a) the bottom? (b) On each end? (c) On each side?
- 8.** The small piston of a hydraulic lift (Fig. P14.8) has a cross-sectional area of 3.00 cm<sup>2</sup>, and its large piston has a cross-sectional area of 200 cm<sup>2</sup>. What downward force of magnitude  $F_1$  must be applied to the small piston for the lift to raise a load whose weight is  $F_g = 15.0$  kN?



**Figure P14.8**

17. Normal atmospheric pressure is  $1.013 \times 10^5 \text{ Pa}$ . The approach of a storm causes the height of a mercury barometer to drop by 20.0 mm from the normal height. What is the atmospheric pressure?
37. A large storage tank, open at the top and filled with water, develops a small hole in its side at a point 16.0 m below the water level. The rate of flow from the leak is found to be  $2.50 \times 10^{-3} \text{ m}^3/\text{min}$ . Determine (a) the speed at which the water leaves the hole and (b) the diameter of the hole.
50. A siphon is used to drain water from a tank as illustrated in Figure P14.50. Assume steady flow without friction. (a) If  $h = 1.00 \text{ m}$ , find the speed of outflow at the end of the siphon. (b) **What If?** What is the limitation on the height of the top of the siphon above the end of the siphon? *Note:* For the flow of the liquid to be continuous, its pressure must not drop below its vapor pressure. Assume the water is at  $20.0^\circ\text{C}$ , at which the vapor pressure is 2.3 kPa.

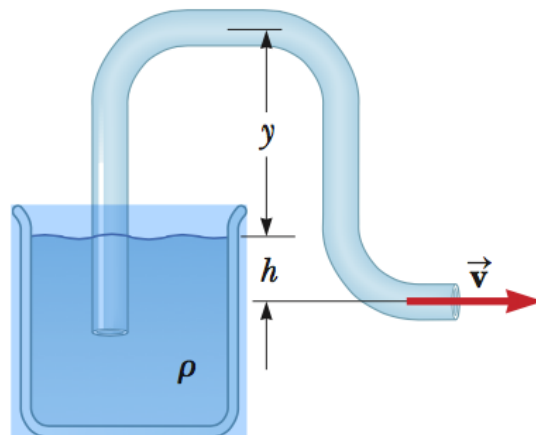


Figure P14.50

