Continuation of Answers

Answers continued from p. 94

4. Molasses has a higher viscosity than milk does.

5. **a.** 15 N

b. The object would sink because weight exceeds buoyant force.

6. The iron will float because it is less dense than mercury.

7. **a.** Fluid speed increases because fluid pressure decreases.

b. As fluid speed between the boats increases, fluid pressure decreases. If the pressure on the outer sides of the boats exceeds the pressure between them, the boats are pushed together.

8. $P = F/A = 1{,}025\ \text{N}/3.75\ \text{m}^2 = 273\ \text{Pa}$

9. $F_2 = F_1/A_1 \times A_2 = 12{,}000\ \text{N}/0.90\ \text{m}^2 \times 0.020\ \text{m}^2 = 270\ \text{N}$

Answers continued from p. 101

5. Sample answer: Boyle's law states that the volume of a gas increases as pressure decreases at constant temperature. Charles's law states that the volume of a gas increases as temperature increases at constant pressure. Gay-Lussac's law states that gas pressure increases as temperature increases at constant volume.

6. Sample answer: Boyle's law: If you let air out of a tire, the air will expand outside of the tire, because pressure on the air decreases. Charles's law: When pressure is constant, the air in a balloon will expand if the balloon is exposed to heat. Gay-Lussac's law: If you heat a spray can, which has constant volume, it may explode due to the increase in pressure.

7. Gases have low densities because their particles are so far apart.

8. The volume of a gas can be changed by changing either the temperature or pressure.

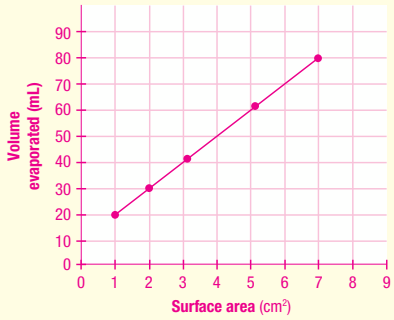
9. Sample answer: Leaving the balloon on a sunny windowsill will cause the temperature of the gas in the balloon to increase. According to Charles's law, the volume will increase as the temperature increases at constant pressure.

10. $V_2 = V_1P_1/P_2 = (1.56 \times 10^3\ \text{L}) \times 98.9\ \text{kPa}/44.1\ \text{kPa} = 3.50 \times 10^3\ \text{L}$

Answers continued from p. 107

Graphing Skills

23. Sample graph:



a. The graph is linear.

b. A linear line indicates that an increase in surface area causes an increase in evaporation.

24. The temperature is increasing. Ethylene glycol undergoes a change of state at 197 °C; it is changing from a liquid to a gas. At 197 °C, ethylene glycol molecules are absorbing energy to vaporize, so there is no increase in temperature.

Math Skills

25. $1{,}500\ \text{N}/500\ \text{Pa} = 3\ \text{m}^2;\ 500\ \text{Pa}/2 = 250\ \text{Pa}$

26. $\dfrac{(1.0 \times 10^6\ \text{N})(0.7\ \text{m}^2)}{140\ \text{m}^2} = 5 \times 10^3\ \text{N}$

27. $\dfrac{1.8\ \text{kPa} \times 2.8\ \text{L}}{1.2\ \text{kPA}} = 4.2\ \text{L}$

28. $\dfrac{6.5\ \text{kPa} \times 2.2\ \text{L}}{1.15\ \text{kPa}} = 12\ \text{L}$