1. **HYDROGEN BONDING**: applies to polar molecules with a bond between hydrogen and F, O, and/or N
   **DIPOLE-DIPOLE**: applies to polar molecules
   **LONDON**: applies to all molecules, increases with # electrons

2. “b” corrects for the actual space occupied by gas particles. This increases the volume (as compared to ideal volume), so the correction is subtracted from the actual volume

3. Molecular solutes that exhibit the same intermolecular forces will be soluble. In this case that is only London forces

4. a. The line between solid and liquid slants from left at top to right at bottom when the density of the solid is less than the density of the liquid. This is the case for water. The line between solid and liquid slants from right at the top to left at bottom when the density of the solid is greater than the density of the liquid. This is the case for carbon dioxide.
   b. Sulfur begins as a rhombic solid; as the temperature increases (95ºC) it becomes a monoclinic solid; as the temperature increases further 119ºC) it becomes a liquid

5. \( V = 360. \text{L} \)

6. Molar mass = 85.8 g/mol

7. a. \( \text{F}_2 < \text{H}_2\text{S} < \text{CH}_3\text{OH} \); \( \text{F}_2 \) has London forces only; \( \text{H}_2\text{S} \) has London forces and dipole-dipole forces; \( \text{CH}_3\text{OH} \) has London forces, dipole-dipole forces and hydrogen bonding. Since \( \text{F}_2 \) has the weakest intermolecular forces, it has the highest vapor pressure.
   b. \( T_2 = 89^\circ\text{C} \)

8. a. rms speed = 341 m/s
   b. \( M_M = 63.9 \text{ g/mol} \)

9. a. \( \Delta H_{\text{vap}} = 43.0 \text{ kJ/mol} \)
   b. 669 g ice

10. a. \( \Delta P = 20.0 \text{ mmHg} \)
    b. molality = 2.20 \( m \)