A. Explain each of the following underlined statements in terms of a relationship between P, V, n, and/or T. The first one is done for you already, as an example.
   i) You let go of a helium balloon outside and it floats up into the sky. Assume no gas escapes and the temperature stays the same. The balloon should expand, the higher it gets. **Answer:** As the balloon climbs, pressure decreases. Because P and V are inversely proportional when n and T are held constant (P₁V₁=P₂V₂), the volume of the balloon will increase in response.
   ii) You fill up your bike tires up to a certain pressure. After riding your bike for an hour, the pressure in the tires is higher. (Hint: Consider the effect of friction, between the road and your tires, which warms the air in the tire. Assume that the volume does not change.)
   iii) You put a piece of dry ice in an empty plastic soda-pop bottle and put the cap on. You’ve now made a “dry ice bomb,” as the pressure inside the container becomes dangerously high, causing a potential explosion.
   iv) A scuba diver takes a deep breath of air when she is 50 ft below the surface of water. Because of the weight of the water, the pressure of air she inhales is about 2 atm, twice as high as the pressure at the surface of the water. As she ascends back to the surface, she holds her breath and, as a result, the volume of gas in her lungs expands. (This is a dangerous situation, and the reason why you must never do this while scuba diving!)

Suggested problems for extra practice:

*Chapter 11: 29, 33, 37, 39, 43, 45, 49, 51, 55, 57, 59, 63, 65, 67, 73, 75.*

*Chapter 12: 63 through 75 (odds), 85, 95.*