Gas Laws Problem Set 1

1. Jacques Charles attempts to inflate his toy hot air balloon with short bursts from a burner. The initial volume of the balloon is 1000L. Trying to impress a passing woman, Jacques lets a long burst of heat out from the burner. The long burn increases the temperature of the air within the balloon from 60˚C to 65˚C. How much does the balloon inflate? Show your work.

2. Always helpful, Danny persuades his little sister Suzie that her Very Special Birthday Balloon will last much longer if she puts in the refrigerator in the basement for a while. The temperature in the house is 20.0˚C. The balloon has an initial volume of 0.50L. If the balloon has collapsed to 0.09L by the time Suzie catches on to Danny's devilish deed, what is the temperature inside the refrigerator? Show your work.

3. A rubber dodge ball sits in a 20.0˚C basement, filled with 5.50L of compressed air. Eager to begin practice for impending dodgeball season, Vince finds the ball and takes it outside. After a few hours of practice, the well-sealed ball has a volume of 1.00L. What's the temperature outside in ˚C? What is the temperature in ˚F? Where do you think Vince lives? Show your work.

Charles' Law