Charles' Law Problems Name_____

Don't forget to use the Kelvin Temp.!!!!

1) A 50.0 ml soap bubble is blown in a 27.0°C room. It drifts out an open window and lands in a snow bank at -3.0°C. What is its new volume?

2) A balloon was inflated to a volume of 5.0 liters at a temperature of 7.0°C. It landed in an oven and was heated to 147°C. What is its new volume?

3) During the day at 27°C a cylinder with a sliding top contains 20.0 liters of air. At night it only holds 19 liters. What is the temperature at night? Give the answer in Kelvin and °C?

4) A 113L sample of Helium at 27°C is cooled to -78°C. Calculate the new volume of the Helium.

5) On all aerosol cans you see a warning that tells you to keep the can away from heat because of the danger of explosion. What is the potential volume of the gas contained in a 500.0 mL can at 25°C if it were heated to 54°C. In other words if the can could expand to allow the gas to take up a greater volume, what would be the new volume of the gas when heated as previously described?

6) A 0.20 ml CO_2 bubble in a cake batter is at 27°C. In the oven it gets heated to 177°C. What is its new volume?

If the cake had 5,000.0 bubbles, by how many ml. would the cake rise when it was cooked.

What common ingredient was used to create the original CO_2 bubble?

7) A 500.0 ml. Glass filled with air is placed into water up-side-down while at 7.0°C. The water is heated to 77°C. How much air bubbles out from under the glass?

8) At one point in history people could measure temperature by looking at the volume of a sample of gas. Suppose a sample in a gas thermometer has a volume of 135mL at 11.0°C. Indicate what temperature would correspond to each of the following volumes: 113 mL, 142, mL, 155 mL , 127mL.

Answers: 1) 45 ml 2) 7.5 liters 3) 285 K or 12 °C 4) 73 L 5) 550 ml
6) 0.30 ml 500 ml baking soda ($NaHCO_3$) 7) 125 ml
8) 238 K or –35.3 °C; 299 K or 25.7 °C; 326 K or 53.1 °C; 267 K or -5.83 °C