Charles' Law Worksheet

1) The temperature inside my refrigerator is about 4^0 Celsius. If I place a balloon in my fridge that initially has a temperature of 22^0 C and a volume of 0.5 liters, what will be the volume of the balloon when it is fully cooled by my refrigerator?

2) A man heats a balloon in the oven. If the balloon initially has a volume of 0.4 liters and a temperature of 20 ^{0}C, what will the volume of the balloon be after he heats it to a temperature of 250 ^{0}C?

3) On hot days, you may have noticed that potato chip bags seem to "inflate", even though they have not been opened. If I have a 250 mL bag at a temperature of 19 ^{0}C, and I leave it in my car which has a temperature of 60^0 C, what will the new volume of the bag be?

4) A soda bottle is flexible enough that the volume of the bottle can change even without opening it. If you have an empty soda bottle (volume of 2 L) at room temperature (25 ^{0}C), what will the new volume be if you put it in your freezer (-4 ^{0}C)?

5) Some students believe that teachers are full of hot air. If I inhale 2.2 liters of gas at a temperature of 18^0 C and it heats to a temperature of 38^0 C in my lungs, what is the new volume of the gas?

6) How hot will a 2.3 L balloon have to get to expand to a volume of 400 L? Assume that the initial temperature of the balloon is 25 ^{0}C.

7) I have made a thermometer which measures temperature by the compressing and expanding of gas in a piston. I have measured that at 100^0 C the volume of the piston is 20 L. What is the temperature outside if the piston has a volume of 15 L? What would be appropriate clothing for the weather?