**Gas Law Problems #4**

For problems 1 through 4 assume constant temperature.

1. 20.0 mL of a gas at 700.0 mm Hg will occupy what volume at:
   a. 800. mm Hg of pressure?  
   b. 500. mm Hg of pressure?

2. 5.40 liters of carbon dioxide at 2.30 atm will exert what pressure if the volume is changed to:
   a. 2.30 liters?  
   b. 17.3 liters?

3. 4.70 cubic feet of helium exert a pressure of 39.4 lbs./in$^2$, what will be the pressure if the volume is changed to:
   a. 16.2 ft$^3$?  
   b. 1.20 ft$^3$?

4. If a person’s lungs can hold 2.30 liters of air at one atmosphere of pressure:
   a. what volume will they hold at 87 ft below the surface of sea water where the pressure is 4.00 atm?  
   b. What volume will they hold if they could expand at an altitude where the pressure is 0.68 atm? (Don’t fly after diving!)

For problems 5 through 8 assume constant pressure.

5. 500.0 mL of a gas at 40.0˚ C will occupy what volume at:
   a. -30.0˚ C?  
   b. 90.0˚ C?

6. If 7.4 liters of carbon monoxide at 78.0˚ C is
   a. compressed to 3.48 liters, what will the final temperature of the gas be?  
   b. expanded to 19.2 liters, what will the final temperature of the gas be?

7. If 0.0046 ft$^3$ of methane gas at 25.0˚ C is:
   a. allowed to expand to 2.64 ft$^3$, what will be the final temperature of the gas?  
   b. Compressed to 0.000050 ft$^3$, what will be the final temperature of the gas?

8. What is the final temperature of a gas at 0.0˚ C if 540.0 mL of the gas is allowed to:
   a. expand to 800.0 mL?  
   b. expand to 3.40 liters?
Solutions

1.  a. 17.5 mL
   b. 28.0 mL

2.  a. 5.40 atm
    b. 0.718 atm

3.  a. 11.4 lbs./in²
    b. 154 lbs./in²

4.  a. 0.575 L
    b. 3.38 L

5.  a. 388 mL
    b. 580 mL

6.  a. 170 K or -103° C
    b. 910 K or 637° C

7.  a. 170,000 K or 170,000° C
    b. a. 3.2 K or 280° C

8.  a. 404 K or 127° C
    b. 1719 K or 1446° C