SCH3U Boyle's Law Worksheet

1. State the pressure-volume law both in words and in the form of an equation.

2. To compress nitrogen at 1 atm from 750 mL to 500 mL, what must the new pressure be if the temperature is kept constant? *1.5 atm*

3. If oxygen at 128 kPa is allowed to expand at constant temperature until its pressure is 101.3 kPa, how much larger will the volume become? *1.26*

4. A sample of nitrogen at 101.3 kPa with a volume of 100 mL is carefully compressed at constant temperature in successive changes in pressure, equaling 5 kPa at a time, until the final pressure is 133.3 kPa. Calculate each new volume and prepare a plot of P versus V, showing P on the horizontal axis.

5. A sample of nitrogen at 20°C was compressed from 300 mL to 0.360 mL and its new pressure was found to be 400.0 Pa. What was the original pressure in kPa? *4.8×10^{-4}*

6. The pressure on 6.0 L of a gas is 200 kPa. What will be the volume if the pressure is doubled, keeping the temperature constant? *3L*

7. What would be the new volume if the pressure on 600 mL is increased from 90 kPa to 150 kPa? *360 mL*

8. A student collects 25 mL of gas at 96 kPa. What volume would this gas occupy at 101.325 kPa. There is no change in temperature or mass. *23.68 mL*

9. A gas measuring 525 mL is collected at 104.66 kPa. What volume does this gas occupy at 99.33 kPa? *553.17 mL*

10. A mass of gas occupies 1 L at 1 atm. At what pressure does this gas occupy
a) 2 litres, *0.5 atm*
b) 0.5 litres? *2 atm*

11. From the data in the following table calculate the missing quantity (assuming constant temperature).

a)	V1 = 22.4 L; P1= 1 atm; P2 = ? atm; V2 = 2.8 L	*8 atm*
b)	V1 = 60 mL; P1 = ? kPa; P2 = 101.3 kPa; V2 = 16 mL	*27 kPa*
c)	V1 = ? m3 ; P1 = 40 Pa; P2 = 100 kPa; V2 = 1.0 L	*2500 L= 2.5 x 109 m3*
d)	V1 = 2.50 L; P1 = 7.5 atm; P2 = ? atm; V2 = 100 mL	*187.5 atm*