

Name: _____

Date: _____

Chemistry **Gas Laws WS 1**

- I. *Answer the following questions using Boyle's Law, showing all work and circling your answer:*
1. The volume of a piston in an engine decreases to one-fifth its original volume as gasoline vapor is compressed. Assuming the temperature does not change, what happens to the pressure of the gas in the piston?

 2. The volume of a gas is 20.4 L when the pressure is 925 kPa. At constant temperature, a change in pressure causes the volume of the sample to change. If the new volume is 30.6 L, what is the new pressure?

 3. A piston compresses 2.50 L of air at STP to a volume of 0.77 L. What is the final pressure of the air?

 4. A 2.10 L vessel contains 4.65 g of nitrous oxide (N_2O) at 1.00 atm. What will be the pressure of this gas in a container that's half the size?

 5. Three gases at standard temperature are introduced into a 20.0 L container with the following pressures:
 - 1.0 L of oxygen gas at 150 kPa
 - 2.0 L of nitrogen gas at 200. KPa
 - 3.3 L of hydrogen gas at 78 kPaWhat will be the total pressure of the mixed gases inside this container?

II. *Answer the following questions using Charles' Law, showing all work and circling your answer:*

6. 74.3 L of oxygen gas is cooled from 59°C to -21°C . What would be its new volume?

7. A balloon, inflated in an air-conditioned room at 27°C , has a volume of 4.0 L. It is heated to a temperature of 57°C . What is the new volume of the balloon?

8. Under constant-pressure conditions, a sample of hydrogen gas initially at 88°C and 9.6 L is cooled until its final volume is 3.4 L. What is its final temperature?

9. A gas in a balloon with a volume of 0.30 L at 150°C is heated until its volume is 0.55 L. What is the new temperature of the gas if the pressure remains constant?

10. A sample of gas has a volume of 1.52 L when its temperature is 18°C . If its temperature is increased to 32°C , what will be its new volume?

11. A 21.50 L gas sample at 14°C and a pressure of 770 mmHg is heated to expand to a volume of 80.00 L. What is the final temperature of the gas if its pressure remains constant?

12. If a sample of gas was changed to occupy 6.8 L at 376°C and 1.0 atm, what was its volume at standard temperature and pressure (STP)?