

**Gas Laws Quest****Multiple Choice**

Identify the choice that best completes the statement or answers the question.

1. A gas is confined in a steel tank with a volume of 6.982 L. At 20.20°C, the gas exerts a pressure of 8.532 atm. After heating the tank, the pressure of the gas increases to 10.406 atm. What is the temperature of the heated gas? (Gay Lussac's Law)
  - a. -32.60°C
  - b. 24.63°C
  - c. 84.59°C
  - d. 92.64°C
2. How many moles of helium gas are contained in a 4.0-L flask at STP? (Gas Stoichiometry)
  - a. 0.045 mol
  - b. 0.089 mol
  - c. 0.17 mol
  - d. 89 mol
3. What volume of oxygen (O<sub>2</sub>) is needed to react with solid sulfur (S) to form 6.20 L of sulfur dioxide (SO<sub>2</sub>)
  - a. 6.20 L
  - b. 7.20 L
  - c. 12.4 L
  - d. 99.2 L
4. How many moles of steam (H<sub>2</sub>O) are produced at 2.00 atm and 202.0°C by the complete combustion of 12.50 L of methane (CH<sub>4</sub>) gas? (Gas Stoichiometry).
  - a. 0.001 mol
  - b. 0.012 mol
  - c. 0.640 mol
  - d. 1.28 mol
5. Four liters of gas at atmospheric pressure is compressed into a 0.85 L gas cylinder. What is the pressure of the compressed gas if its temperature remains constant? (Boyle's Law)
  - a. 0.15 atm
  - b. 0.21 atm
  - c. 3.4 atm
  - d. 4.7 atm
6. When a bicycle reaches the top of a hill with a tire volume of 0.80 L, the atmospheric pressure is 9.0 atm. What is the maximum volume of air that can be filled in the tire just before it bursts? (Boyle's Law)
  - a. 0.088 L
  - b. 1.2 L
  - c. 8.9 L
  - d. 11 L
7. When a milkshake is taken in through a straw at a pressure of 0.071 atm, the straw contains 5.0 mL of liquid. How much liquid is consumed at 0.092 atm? (Boyle's Law)
  - a. 0.10 mL
  - b. 3.9 mL
  - c. 6.3 mL
  - d. 7.8 mL
8. In a hospital, oxygen is administered to patients at 3.0 atm in a hyperbaric oxygen chamber. Oxygen gas, measuring 600.0 L, is compressed in a cylinder at 160.0 atm. What volume of oxygen can a cylinder supply at the given pressure? (Boyle's Law)
  - a. 11 L
  - b. 32 L
  - c.  $11 \times 10^3$  L
  - d.  $32 \times 10^3$  L
9. A balloon is filled with 3.50 L of water at 24.0°C and 2.27 atm. If the balloon is placed outdoors on a hot day at a temperature of 34.0°C, what is the volume of the balloon at constant pressure? (Charles' Law)
  - a. 2.47 L
  - b. 3.38 L
  - c. 3.61 L
  - d. 8.19 L
10. The volume of a sample of helium is 4.50 mL at 20.0°C and 203.0 kPa. What will its volume be at 10.0°C and 203.0 kPa? (Charles Law)
  - a. 2.25 mL
  - b. 3.78 mL
  - c. 4.34 mL
  - d. 6.85 mL

11. A 40.0-L sample of fluorine is heated from 90.0°C to 186.0°C. What volume will the sample occupy at the higher temperature? (Charles' Law)
  - a. 19.3 L
  - b. 31.6 L
  - c. 50.5 L
  - d. 82.6 L
12. The volume of a gas is 1.50 L at 30.0°C and 1.00 atm. What volume will the gas occupy if the temperature is raised to 134.0°C at constant pressure? (Charles' Law)
  - a. 0.331 L
  - b. 1.11 L
  - c. 2.01 L
  - d. 6.70 L
13. A sample of carbon dioxide occupies a 2.54 dm<sup>3</sup> container at STP. What is the volume of the gas at a pressure of 150.0 kPa and a temperature of 26.0°C? (Combined Gas Law)
  - a. 0.180 dm<sup>3</sup>
  - b. 1.88 dm<sup>3</sup>
  - c. 2.24 dm<sup>3</sup>
  - d. 4.65 dm<sup>3</sup>
14. A diver finds the best corals at a depth of approximately 10.0 m. The diver's lung capacity is 2.40 L. The air temperature is 32.0°C and the pressure is 101.30 kPa. What is the volume of the diver's lungs at 10.00 m, at a temperature of 21.0°C, and a pressure of 141.20 kPa? (Combined Gas Law)
  - a. 1.12 L
  - b. 1.66 L
  - c. 1.78-L
  - d. 4.86 L
15. One liter of a gas has a pressure of 150.00 kPa at 25.0°C. If the pressure increases to 600.0 kPa and the temperature to 100.0°C, what would be the new volume of the gas? (Combined Gas Law)
  - a. 0.200 L
  - b. 0.312 L
  - c. 1.00 L
  - d. 2.90 L

**Matching**

- |                  |                     |
|------------------|---------------------|
| a. Charles' Law  | d. Gay Lussac's Law |
| b. Ideal Gas Law | e. Combined Gas Law |
| c. Boyle's Law   |                     |

16. formula used when there is a change in pressure, volume, and temperature
17. states that the volume of a gas varies inversely with its pressure if temperature is held constant
18.  $PV = nRT$
19. states that the volume of a gas varies directly with the Kelvin temperature, assuming pressure is constant
20. pressure and temperature are directly proportional with one another

Name	
Date	Period

A B C D E	A B C D E
1 ○ ○ ○ ○ ○	11 ○ ○ ○ ○ ○
2 ○ ○ ○ ○ ○	12 ○ ○ ○ ○ ○
3 ○ ○ ○ ○ ○	13 ○ ○ ○ ○ ○
4 ○ ○ ○ ○ ○	14 ○ ○ ○ ○ ○
5 ○ ○ ○ ○ ○	15 ○ ○ ○ ○ ○
6 ○ ○ ○ ○ ○	16 ○ ○ ○ ○ ○
7 ○ ○ ○ ○ ○	17 ○ ○ ○ ○ ○
8 ○ ○ ○ ○ ○	18 ○ ○ ○ ○ ○
9 ○ ○ ○ ○ ○	19 ○ ○ ○ ○ ○
10 ○ ○ ○ ○ ○	20 ○ ○ ○ ○ ○