Gas Laws Worksheet - CP

For questions (a → f) circle the answer that describes what would happen in each scenario:

a) For Boyle's law if *pressure* increases, what happens to *volume*? _____

b) For Boyle's Law, if *volume* decreases, what happens to *pressure*? _____

c) For Charles's Law, if *temperature* increases, what happens to *volume*? _____

d) For Charles's Law, if *volume* decreases, what happens to *temperature*? _____

e) For Gay-Lussac's Law, if *pressure* increases, what happens to *temperature*? _____

f) For Gay-Lussac's Law, if *temperature* decreases, what happens to *pressure*? _____

1) If 22.5 L of nitrogen at 748 mm Hg are compressed to 725 mm Hg at constant temperature. What is the new volume?

Law:

Equation: P1 =
P2 =
V1 =
V2 =

Relationship:

2) Calculate the decrease in temperature when 6.00 L at 20.0 °C is compressed to 4.00 L.

Law:

Equation: T1 =
T2 =
V1 =
V2 =

Relationship:

3) The gases in a hair spray can are at a temperature of 27 ºC and a pressure of 3 atm . If the gases in the can reach a pressure of 9 atm, the can will explode. To what temperature must the gases be raised in order for the can to explode? Assume constant volume.

Law:

Equation: T1 =
T2 =
P1 =
P2 =

Relationship:

4) A gas balloon has a volume of 106.0 liters when the temperature is 45.0 °C and the pressure is 740.0 mm of mercury. What will its volume be at 20.0 °C and 780 .0 mm of mercury pressure?

Law:

Equation: T1 =
T2 =
V1 =
V2 =

Relationship: P1 =
P2 =

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5) What pressure is required to compress 196.0 liters of air at 1.00 atmosphere into a cylinder whose volume is 26.0 liters?

Law: V1 =
V2 =
Equation: P1 =
P2 =
Relationship:

6) A gas occupies 900.0 mL at a temperature of 27.0 °C. What is the volume at 132.0 °C?

Law: T1 =
T2 =
Equation: V1 =
V2 =
Relationship:

7) Maybelline Cousteau's backup oxygen tank reads 900 mmHg while on her boat, where the temperature is 27 °C. When she dives down to the bottom of an unexplored methane lake on a recently-discovered moon of Neptune, the temperature will drop down to –183 °C. What will the pressure in her backup tank be at that temperature?

Law: T1 =
T2 =
Equation: P1 =
P2 =
Relationship:

8) If 10.0 liters of oxygen at STP are heated to 512 °C, what will be the new volume of gas if the pressure is also increased to 2.0 atm?

Law: T1 =
T2 =
Equation: V1 =
V2 =
Relationship: P1 =
P2 =

9) A gas is heated from 263.0 K to 298.0 K and the volume is increased from 24.0 liters to 35.0 liters by moving a large piston within a cylinder. If the original pressure was 1.00 atm, what would the final pressure be?

Law: T1 =
T2 =
Equation: V1 =
V2 =
Relationship: P1 =
P2

10) The pressure of a gas is reduced from 1200.0 mm Hg to 850.0 mm Hg as the volume of its container is increased by moving a piston from 85.0 mL to 350.0 mL. What would the final temperature be if the original temperature was 90.0 °C?

Law: T1 =
T2 =
Equation: V1 =
V2 =
Relationship: P1 =
P2 =

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