

Mixed Up Gas Laws Practice

STP = “Standard Temperature and Pressure”

Standard Temperature = 273 K

Standard Pressure = 1.00 atm = 101.325 kPa = 760 mm Hg = 760 torr

Kelvin = Celsius + 273

These are a mixture of Boyle, Charles, and Gay Lussac’s Law problems.

Remember to include the correct units and round off to significant digits. These problems should be done on a separate sheet of paper.

1. Maria and Tom have trapped 240 mL of gas in a tube with a piston at a pressure of 1.00 atm. What will the pressure become if Tom pushes the piston in to make the volume 80.0 mL?
2. Now Maria takes over, as usual. She once again traps 240 mL of gas. She finds its temperature to be 17.0 °C, so she gently warms the gas to a new temperature of 307 °C. What is the new volume of the gas?
3. Tom, trying to be very scientific, measures everything he can think of this time. He collects 180 mL of gas at a pressure of 0.84 atm and a temperature of 21.0 °C. Maria then pulls the piston out so that the volume becomes 360 mL at the same temperature. What is the final pressure of this gas?
4. Find the final volume of a gas that was collected at 47 °C if it is then cooled to 21 °C if its original volume was 273 mL.
5. What was the original pressure of 425 mL of gas if its final pressure is 1.8 atm and its final volume is 85.0 mL? The wording of this is challenging. Read it carefully.
6. What was the original temperature of a gas that was warmed to 98 °C if its volume changed from 43 mL to 569 mL?
7. Find the final volume of 780 mL of gas that is cooled from 16 °C to –96 °C.
8. Find the original volume of a gas whose pressure changed from 7.9 atm to 19.0 atm if its final volume is 714 mL.
9. What is the new pressure when 10.0 atm of Helium at 200 K is heated to 400 K?
10. What is the new pressure when 5.00 atm of Argon is heated from 25 °C to 50° C?
11. What is the new temperature when Xenon at 2.25 atm and 100°C is changed to 7.50 atm?
12. What temperature must Helium be heated to if you want to change it’s pressure from 1.00 atm to 2.00 at if it starts at 35°C?