Exercises on Pressure and Volume

1. The pressure on 15.0 L of gas is increased from 80 kPa to 320 kPa. If the temperature remains constant, calculate the new volume of the gas.

   (Answer: 3.75 L)

2. 1.00 L of helium gas in a cylinder under 5.68×10^4 kPa pressure fills a balloon at 163 kPa pressure at the same temperature. What is the volume of the balloon?

   (Answer: 348 L)

3. What volume of air at 100 kPa pressure would be required to fill a 35.0 L car tire to a pressure of 285 kPa, if the temperature remains constant?

   (Answer: 99.8 L)

4. The barrel of a bicycle pump has a volume of 108 mL and contains air at 102 kPa pressure. What volume of the barrel would the gas occupy if its pressure increases to 630 kPa assuming the temperature remains constant?

   (Answer: 17.5 mL)

5. Suppose that at sea level you fill a balloon made of perfectly elastic substance, to a volume of exactly 1 L. Keeping its temperature constant, you carry it up the side of a mountain to an altitude of 900 m, where the atmospheric pressure is exactly 90% of its value at sea level. What would the new volume of the balloon be?

   (Answer: 1.1 L)