CHAPTER 11 REVIEW

Gases

SECTION 1

SHORT ANSWER  Answer the following questions in the space provided.

1. \( \text{Pressure} = \frac{\text{force}}{\text{surface area}} \)
   For a constant force, when the surface area is tripled the pressure is
   (a) doubled.
   (b) a third as much.
   (c) tripled.
   (d) unchanged.

2. Rank the following pressures in increasing order.
   (a) 50 kPa
   (b) 2 atm
   (c) 76 torr
   (d) 100 N/m²

3. Explain how to calculate the partial pressure of a dry gas that is collected over water when the total pressure is atmospheric pressure.

PROBLEMS  Write the answer on the line to the left. Show all your work in the space provided.

4. a. Use five to six data points from Appendix Table A-8 in the text to sketch the curve for water vapor’s partial pressure versus temperature on the graph provided below.

   ![Graph](image)

   b. Do the data points lie on a straight line?

   c. Based on your sketch, predict the approximate partial pressure for water at 11°C.
SECTION 1 continued

5. Convert a pressure of 0.200 atm to the following units:

       a. mm Hg

       b. kPa

6. When an explosive like TNT is detonated, a mixture of gases at high temperature is created. Suppose that gas X has a pressure of 50 atm, gas Y has a pressure of 20 atm, and gas Z has a pressure of 10 atm.

       a. What is the total pressure in this system?

       b. What is the total pressure in this system in kPa?

7. The height of the mercury in a barometer is directly proportional to the pressure on the mercury’s surface. At sea level, pressure averages 1.0 atm and the level of mercury in the barometer is 760 mm (30. in.). In a hurricane, the barometric reading may fall to as low as 28 in.

       a. Convert a pressure reading of 28 in. to atmospheres.

       b. What is the barometer reading, in mm Hg, at a pressure of 0.50 atm?

c. Can a barometer be used as an altimeter (a device for measuring altitude above sea level)? Explain your answer.
CHAPTER 11 REVIEW

Gases

SECTION 1

SHORT ANSWER Answer the following questions in the space provided.

1. **b** Pressure = \( \frac{\text{force}}{\text{surface area}} \). For a constant force, when the surface area is tripled the pressure is

   (a) doubled.
   (b) a third as much.
   (c) tripled.
   (d) unchanged.

2. **d, c, a, b** Rank the following pressures in increasing order.

   (a) 50 kPa       (c) 76 torr
   (b) 2 atm        (d) 100 N/m²

3. Explain how to calculate the partial pressure of a dry gas that is collected over water when the total pressure is atmospheric pressure.

   Subtract the vapor pressure of water at the given collecting temperature from the atmospheric pressure taken during the collection of the gas.

PROBLEMS Write the answer on the line to the left. Show all your work in the space provided.

4. **a.** Use five to six data points from Appendix Table A-8 in the text to sketch the curve for water vapor’s partial pressure versus temperature on the graph provided below.

   ![Graph of vapor pressure versus temperature](image)

   **No** b. Do the data points lie on a straight line?

   **10 torr** c. Based on your sketch, predict the approximate partial pressure for water at 11°C.
SECTION 1 continued

5. Convert a pressure of 0.200 atm to the following units:

   a. mm Hg
   __________ 152_________

   b. kPa
   __________ 20.3_________

6. When an explosive like TNT is detonated, a mixture of gases at high temperature is created. Suppose that gas X has a pressure of 50 atm, gas Y has a pressure of 20 atm, and gas Z has a pressure of 10 atm.

   a. What is the total pressure in this system?
   __________ 80 atm_________

   b. What is the total pressure in this system in kPa?
   __________ 8.1 \times 10^3\text{ kPa}_________

7. The height of the mercury in a barometer is directly proportional to the pressure on the mercury’s surface. At sea level, pressure averages 1.0 atm and the level of mercury in the barometer is 760 mm (30. in.). In a hurricane, the barometric reading may fall to as low as 28 in.

   a. Convert a pressure reading of 28 in. to atmospheres.
   __________ 0.93 atm_________

   b. What is the barometer reading, in mm Hg, at a pressure of 0.50 atm?
   __________ 3.8 \times 10^2\text{ mm Hg}_________

   c. Can a barometer be used as an altimeter (a device for measuring altitude above sea level)? Explain your answer.
   Yes; a barometer can approximate an altimeter because the higher you climb into Earth’s atmosphere, the lower the pressure recorded by the barometer.