

AP WORKSHEET 03DEF: ANSWERS

1. In this question P = pressure, V = volume, n = moles of gas, T = Temperature, R = gas constant.

(a) $PV = a$ constant at constant T and n

(b) $\frac{V}{T} = a$ constant at constant P and n

(c) $\frac{V}{n} = a$ constant at constant T and P

(d) $\frac{P}{T} = a$ constant at constant V and n

(e) $\frac{PV}{T} = a$ constant at constant n

(f) $PV = nRT$

2 Kelvin

3. $0.0821 \text{ atm L K}^{-1} \text{ mol}^{-1}$

4.

(a) Straight line passing through the origin if T in K, or intercepting the x-axis at -273 if plotted in degrees Celsius

(b) Curve of decreasing pressure versus increasing volume

5. 7.60×10^5 torr

6. 6.13 atm, the can could explode

7. 2822 KPa

8. 2.43×10^{-5} atm

9. 24.45 L

10. Molar Mass = $\frac{(\text{mass})(R)(T)}{(P)(V)}$

11.

(a) $P_{\text{total}} = P_A + P_B + P_C$

(b) $P_{\text{total}} = n_{\text{total}} \left(\frac{(R)(T)}{V} \right)$

12. 0.017 moles

13. More moles, since ammonia has a smaller molar mass and can effuse more quickly (actual value = 0.26 moles)

14. Molar mass must be larger since it effuses more slowly (actual value = 34.1 g mol⁻¹)

15. 299 K is the lower temperature so the particles possess less energy and move more slowly (actual values = 186 m s⁻¹, 183 m s⁻¹)

