

IB Physics
FA 13.1 - Ideal Gas Law

Name _____ New Age Name _____

Show your work, round to the correct significant figures, circle your answers, and label them with units.

When you have finished this, go to the website and check your answers. If you got a problem wrong, cross it off on the front, and do it correctly on the back.

(1 atm = 1.013×10^5 Pa = 101.3 kPa = 14.7 psi = 760 Torr; $1 \text{ m}^3 = 1000$ liters; $p_{\text{absolute}} = p_{\text{gauge}} + 1 \text{ atm}$;)

1. Convert 1340. Torr absolute to gauge pressure psi. Convert 87.3 kPa gauge to Torr absolute

2. Fred has 1.65 mols of methane gas at 87.2 °C at 56.3 kPa (1 kPa = 1000 Pa). What is the **volume** it occupies?

3. Maryland has 217 grams of Neon (molar mass 20.1797 g/mol) gas in 519 liters at **gauge** pressure of 6.97×10^4 Pa. What must the **temperature** be in **Celsius**? ($1000 \text{ liters} = 1 \text{ m}^3$)

4. An aerosol can is at an absolute pressure of 381 Boogalas when it is at 293 K. If I put it in liquid nitrogen and lower its temperature to 77.0 K, what is the new **pressure** in Boogalas? (1000 milli Boogalas = 1 Boogala)
(Assume it does not leak, and the volume remains constant)

5. A Helium tank contains 3.42 kg of helium and is at a gauge pressure of 145 psi. What will be the **gauge** **pressure** when you have released 1.13 kg of helium?