Ideal Gas Law

As you work through the steps in the lab procedure, record your experimental values and the results on this worksheet. Use the exact values you record for your data to make later calculations.

Procedure A: Constant Temperature

Complete the table below.

Data Table 1

	V (cc)	P (kPa)
Initial		
Final		

What is the algebraic expression for volume correction in terms of P_i, V_i, P_f, and V_f? Your answer should be in the most simplified form.

Use the values from Data Table 1 to calculate the volume of the tubing.

CHECKPOINT 1: Ask your TA to check your table values and calculations.

Procedure B: Varying Temperature

Complete the table below.

Data Table 2

	V (cc)	P (kPa)	T (K)
Initial			
Final			

What is the calculated value of $\dfrac{P_i V_i}{T_i}$?

What is the calculated value of $\dfrac{P_f V_f}{T_f}$?

What is the percent difference between the initial and final values of $\dfrac{PV}{T}$? (Percent differences should not be rounded to one significant figure.)

CHECKPOINT 2: Ask your TA to check your table values and calculations.

Procedure C: Determining the Amount of Gas

Enter the value of the equilibrium temperature.

Complete the table below.

Data Table 3

V (cc)	P (kPa)	$1/P$ (1/kPa)

What is the slope of the plot of V versus $1/P$?

How many moles of gas was present in the syringe?

CHECKPOINT 3: Ask your TA to check your table values, graph, and calculations.

Procedure D: Adiabatic Compression

Complete the table below.

Data Table 4

	V (cc)	P (kPa)	T (K)
Initial			
Final			

What is the theoretical value of peak pressure?

What is the percent difference between the experimental and theoretical values of peak pressure? (Percent differences should not be rounded to one significant figure.)

CHECKPOINT 4: Ask your TA to check your table values and calculations.