UNIVERSITY OF TORONTO
Faculty of Arts and Science

FIRST YEAR PHYSICS LAB
PRACTICAL LABORATORY TEST

Duration - 50 minutes
Calculators without stored data are permitted
No other aids are allowed.

All experimental observations must be recorded in PEN in the exam booklet and data must be plotted (using pen *or* pencil) on the graph paper provided. You are expected to record and analyze your data in the same manner as is normally expected in the lab.

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BOYLE'S LAW

At constant temperature, a given mass of an ideal gas obeys the equation

$$pV = (a\ constant)$$

where p is the pressure of the gas and V is its volume. In this experiment you use dry air at room temperature. The volume of the gas is proportional to the height of the air trapped in the manometer, l.

Using the apparatus provided, obtain five values of p in Torr (mm of Hg) and l covering a wide range of values. Using graphical techniques, test the validity of the above functional relation. Indicate your reasons for choosing the form of the plot.

You may assume that the atmospheric pressure in this room today is 759.0 Torr (mm of Hg) or 101.2 kilopascals.

TEST STRATEGY ADVICE: Remember to quote units throughout. You will be given credit for your estimate of errors; however it is more important that you have taken adequate data and produced a graph of the results, so leave your error calculations to the last. It is more important to have your results suitably plotted than to achieve the full set of five points. If one of the points doesn't fit your line or curve, it is advisable to repeat that measurement.