Avogadro's law.

(1) According to this law, "Equal volumes of any two gases at the same temperature and pressure contain the same number of molecules."

Thus, $V \propto n$ (at constant T and P)

or $V = Kn$ (where K is constant)

or $\frac{V_1}{n_1} = \frac{V_2}{n_2} = ... = K$

Example, $\underset{\substack{2\,moles\\2\,volumes\\2\,litres\\1\,litre\\1\,n\,litre}}{2H_2(g)} + \underset{\substack{1\,mole\\1\,volume\\1\,litre\\1/2\,litre\\1/2\,n\,litre}}{O_2(g)} \longrightarrow \underset{\substack{2\,moles\\2\,volumes\\2\,litres\\1\,litre\\1\,n\,litre}}{2H_2O(g)}$

(2) One mole of any gas contains the same number of molecules (Avogadro's number $= 6.02 \times 10^{23}$) and by this law must occupy the same volume at a given temperature and pressure. The volume of one mole of a gas is called **molar volume, V_m** which is 22.4 L mol^{-1} at S.T.P. or N.T.P.

(3) This law can also express as, "The molar gas volume at a given temperature and pressure is a specific constant independent of the nature of the gas".

Thus, V_m = specific constant $= 22.4\,L\,mol^{-1}$ at S.T.P. or N.T.P.

(4) This law is widely applicable to solve the problems of reactive gaseous system.

Note: **Loschmidt number:** It is the number of molecules present in 1 c.c. of a gas or vapor at S.T.P. Its value is 2.687×10^{19} per c.c.