Barometric distribution law.

(1) For gaseous systems, gravitational force is negligible but this is not true for the gases of high molecular masses such as polymer. In this case, the pressure will be different in vertical positions in a container. The variation of pressure with altitude is given by the so-called Barometric formula.

$$\boxed{P = P^o e^{-Mgh/RT}}$$

Where, P^o and P are the pressure of the gas at the ground level and at a height 'h' from the ground respectively.

M is molecular mass of the gas, g is acceleration due to gravity, R is gas constant and T is temperature in kelvin.

(2) Since number of moles of gas 'n' and density of the gas'd' are directly proportional to pressure hence the above equation may be expressed as, $d = d^o e^{-Mgh/RT}$ and $n = n^o e^{-Mgh/RT}$.

(3) The above equations may be expressed as,

$$\boxed{\log\frac{P}{P^o} = \log\frac{d}{d^o} = \log\frac{n}{n^o} = -\frac{1}{2.303}\times\frac{Mgh}{RT}}$$