

* $A_1, A_2, A_3, \dots, A_n$ - be AM between a & b .

then

$$b = a + (n+1)d$$

$$\Rightarrow d = \frac{b-a}{n+1}$$

* let g_1, g_2, \dots, g_n be GM b/w a & b

then,

$$b = (a)(r)^{n+1}$$

$$\Rightarrow r = \left(\frac{b}{a}\right)^{\frac{1}{n+1}}$$

* let H_1, H_2, \dots, H_n be HM b/w a & b

$$\frac{1}{b} = \frac{1}{a} + (n+1)d$$

$$\Rightarrow d = \frac{1}{(n+1)} \left(\frac{1}{b} - \frac{1}{a} \right)$$

* $AM \geq GM \geq HM$

Let $a_i > 0, i = 1, 2, 3, \dots, n$

$$AM = \frac{a_1 + a_2 + a_3 + \dots + a_n}{n}$$

$$= \frac{\sum_{i=1}^n a_i}{n}$$

$$GM = (a_1 a_2 a_3 \dots a_n)^{1/n}$$

$$= \left(\prod_{i=1}^n a_i \right)^{1/n}$$

$$HM = \frac{n}{\frac{1}{a_1} + \frac{1}{a_2} + \dots + \frac{1}{a_n}}$$

$$= \frac{n}{\sum_{i=1}^n \frac{1}{a_i}}$$