$$\sum_{i=1}^{n} x_i = x_1 + x_2 + \dots + x_n$$

$$\sum_{i=1}^{6} x_i = x_1 + x_2 + x_3 + x_4 + x_6$$

$$\sum x_i^2 = x_1^2 + x_2^2 + \dots + x_n^2$$

$$a \sum x_i = a (x_1 + x_2 + \dots + x_n)$$

$$\left(\sum x_i\right)^{1/2} = (x_1 + x_2 + \dots + x_n)^{1/2}$$

$$\frac{1}{\sum x_i} = \frac{1}{x_1 + x_2 + \dots + x_n}$$

$$\sum \frac{1}{x_i} = \frac{1}{x_1} + \frac{1}{x_2} + \dots + \frac{1}{x_n}$$

$$\sum_{i=1}^{n} x_i y_i = x_1 y_1 + x_2 y_2 + \dots + x_n y_n$$

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

$$\sum (\bar{x}_i + \bar{y}_i) = \sum_{i=1}^{n} \bar{x} \mp \sum_{i=1}^{n} \bar{y}_i$$

$$\sum \log x_i = \log x_1 + \log x_2 + \cdots + \log x_n$$

$$\prod a = a^n$$ الخواص

$$\prod a x_i = a^n \prod x_i$$

$$\prod a b x y = (ab)^n \prod x_i y_i$$

Example

let $x = 2, 3, 4, 5$

$y = 1, 2, 3, 4$

Find

$$\prod x_i = (2)(3)(4)(5)$$
$$= 120$$

$$\prod 3x_i = 3^4 (2)(3)(4)(5)$$
$$= 81(120)$$

$$\prod \frac{1}{x_i} = \frac{1}{\prod x_i} = \frac{1}{120}$$

$$\prod_{i=1}^{4} 2 x_i y_i = 2^4 \prod x_i \prod y_i$$

$$= 2^4 (120)(24)$$
$$= 46080$$

Example: Let $X = 2, 4, 5, 8, 3$
$y = 1, 2, 3, 2, 3$

Find

$$\sum \frac{1}{x_i}, \quad \sum x_i y_i, \quad \sum x_i y_i^2, \quad \sum 2x_i$$

$$\left(\sum x_i\right)^{1/2}, \quad \sum (x_i)^{1/2}$$

$$\sum \frac{1}{x_i} = \sum_{i=1}^{5} \frac{1}{x_i} = \frac{1}{2} + \frac{1}{4} + \frac{1}{5} + \frac{1}{8} + \frac{1}{3} = \frac{169}{120}$$

$$\sum x_i y_i = \sum_{i=1}^{5} (2*1) + (4*2) + (5*3) + (8*2) + (3*3)$$
$$= 50$$

$$\sum x_i y_i^2 = (2*1) + (4*2^2) + (5*3^2) + (8*2^2) + (3*3^2)$$
$$= 122$$

$$\left(\sum x_i\right)^{1/2} = (2+4+5+8+3)^{1/2}$$
$$= (22)^{1/2}$$

$$\sum (x_i)^{1/2} = \sqrt{2} + \sqrt{4} + \sqrt{5} + \sqrt{8} + \sqrt{3}$$

$$\sum 2x_i = 2(22)$$
$$= 44$$

$$\sum \log y_i = \log(1) + \log(2) + \log(3) + \log(2) + \log(3)$$