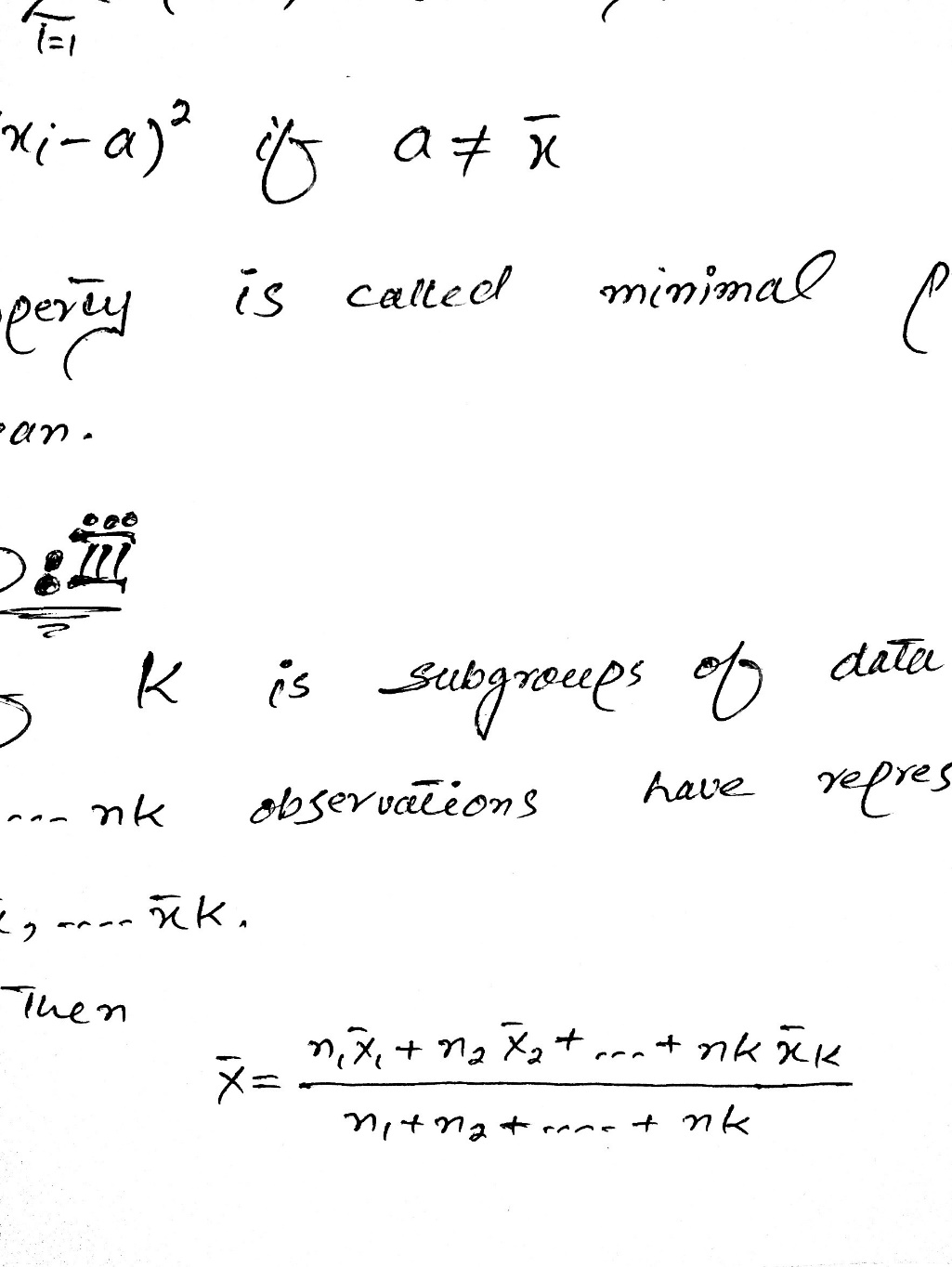
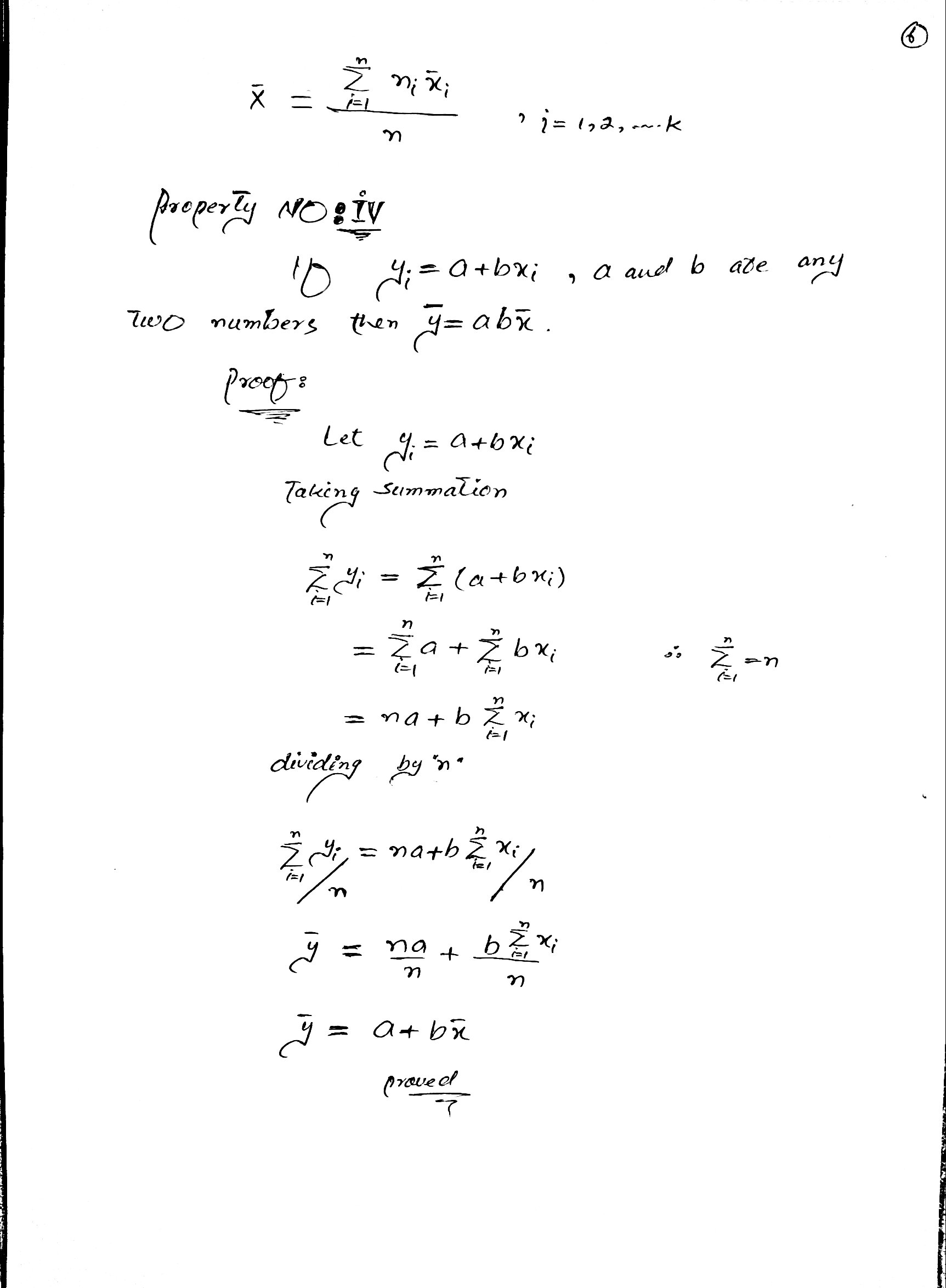
1. **Property No. 3:**

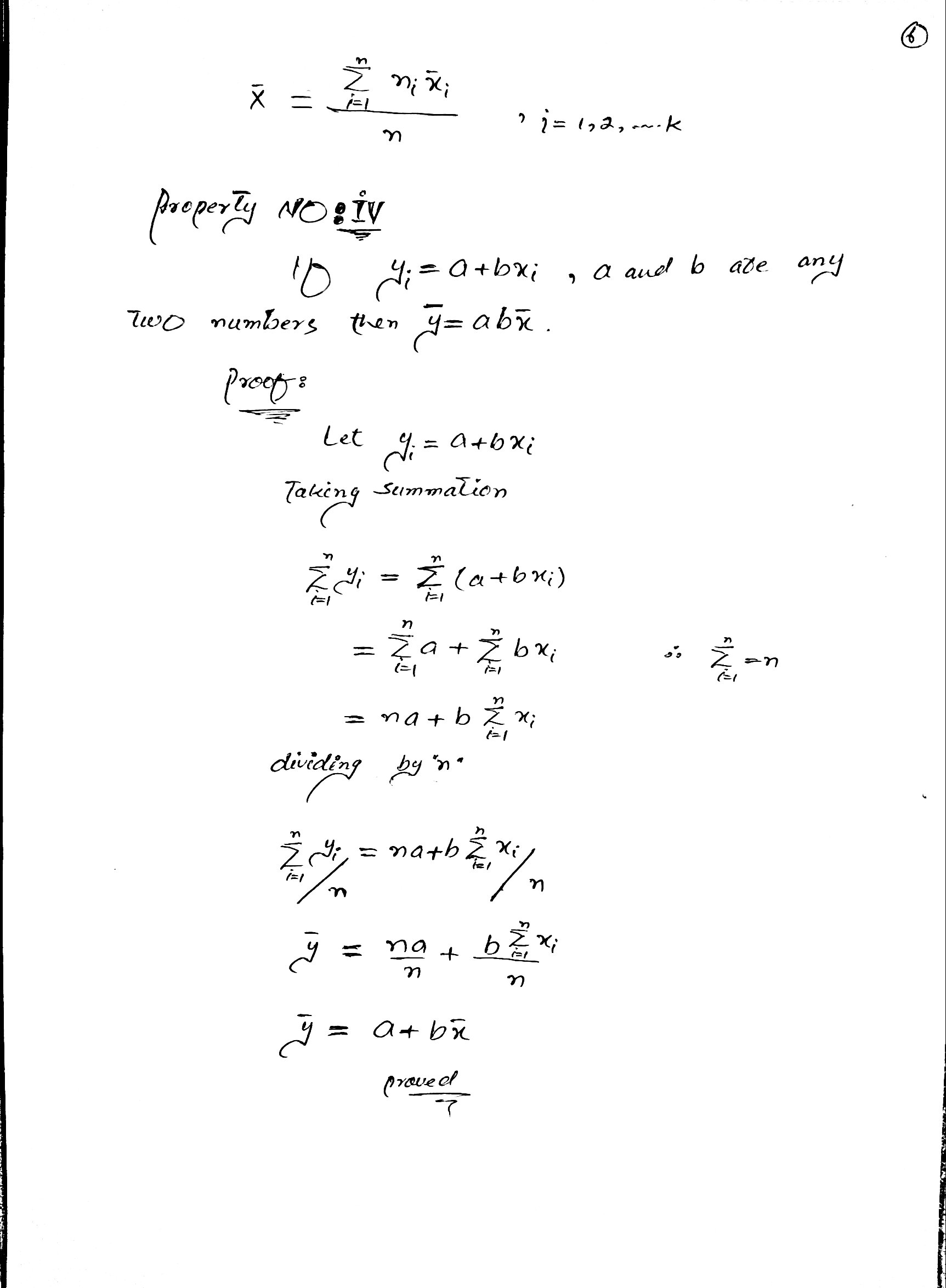
If k is subgroups of the data consisting of n1,n2,…., nk observation have representative means

Then



1. **Property No. 4:**

If , a and b are any two number then

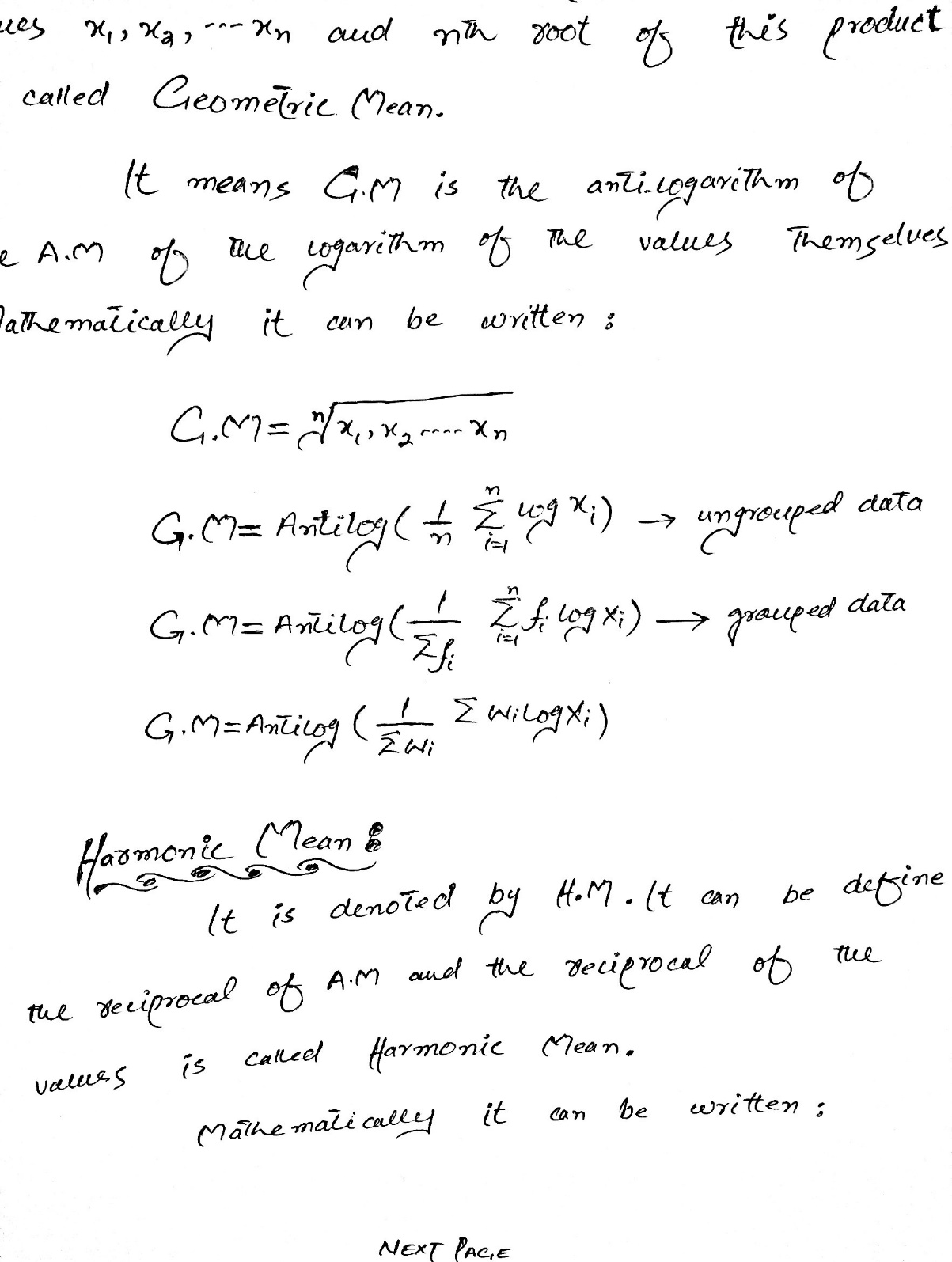
Proof:

**Geometric Mean:**

It is a statistical concept which is used to find the measurement of central tendency. It is denoted by **G.M.**

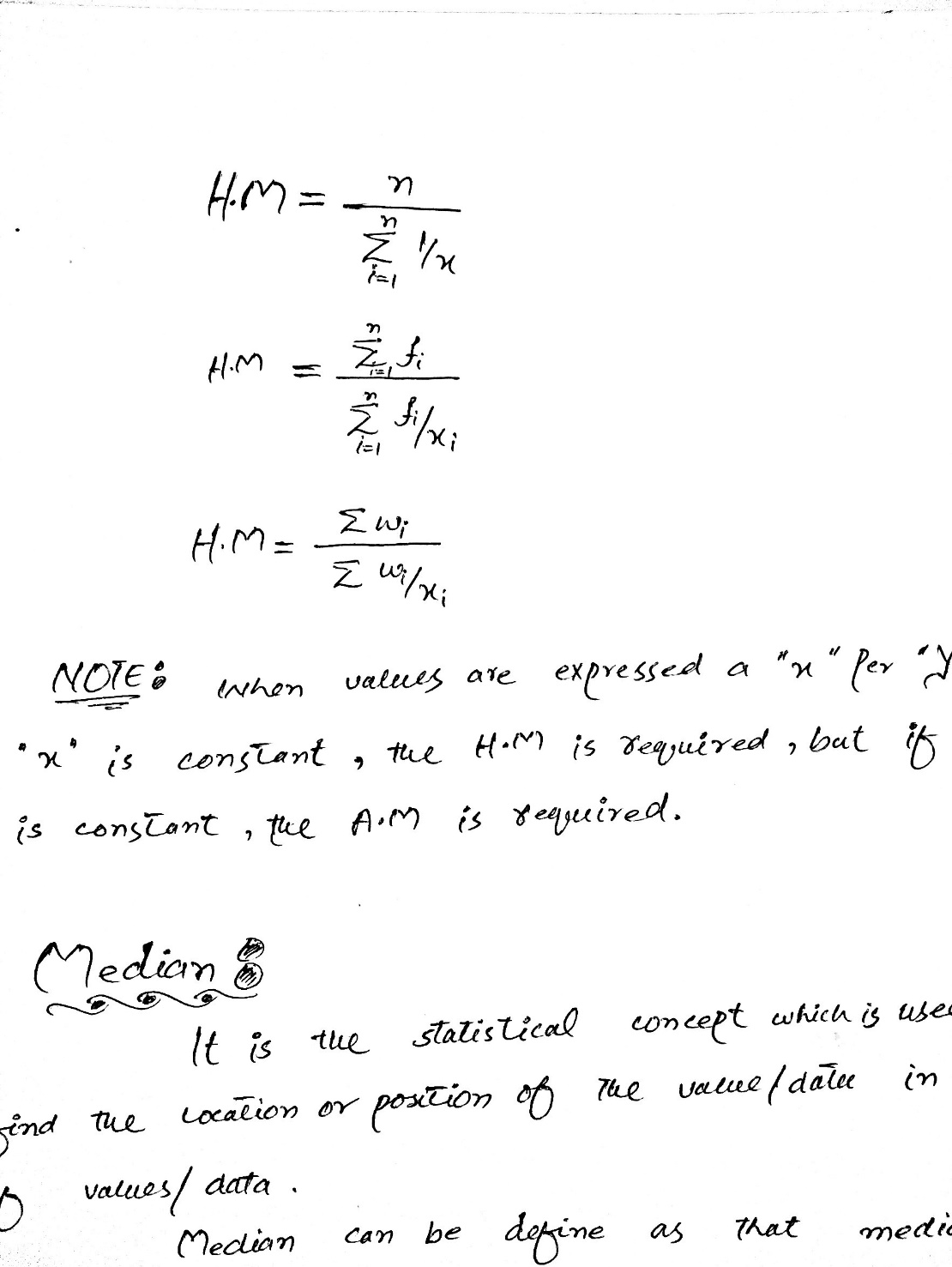
It can be define as the product of n values “X1, X2, X3,……Xn “and nth root of this product is called geometric Mean.

It means G.m is the anti- Logarithm of the A.M of the logarithm of the values themselves.

Mathematically it can be written as:

**Harmonic Mean:**

It is denoted by H.M. it can define the reciprocal of A.M and the reciprocal of the values is called Harmonic Mean.

 Mathematically it can be written:

**Note:** When the caules are expressed as “x” per “y” and “x” is constant, the H.M is required, but if “y” is constant, then A.M is required.

**Median:**

It is the statistical concept which is used to find the location or position of the value / data in a group of values / data.

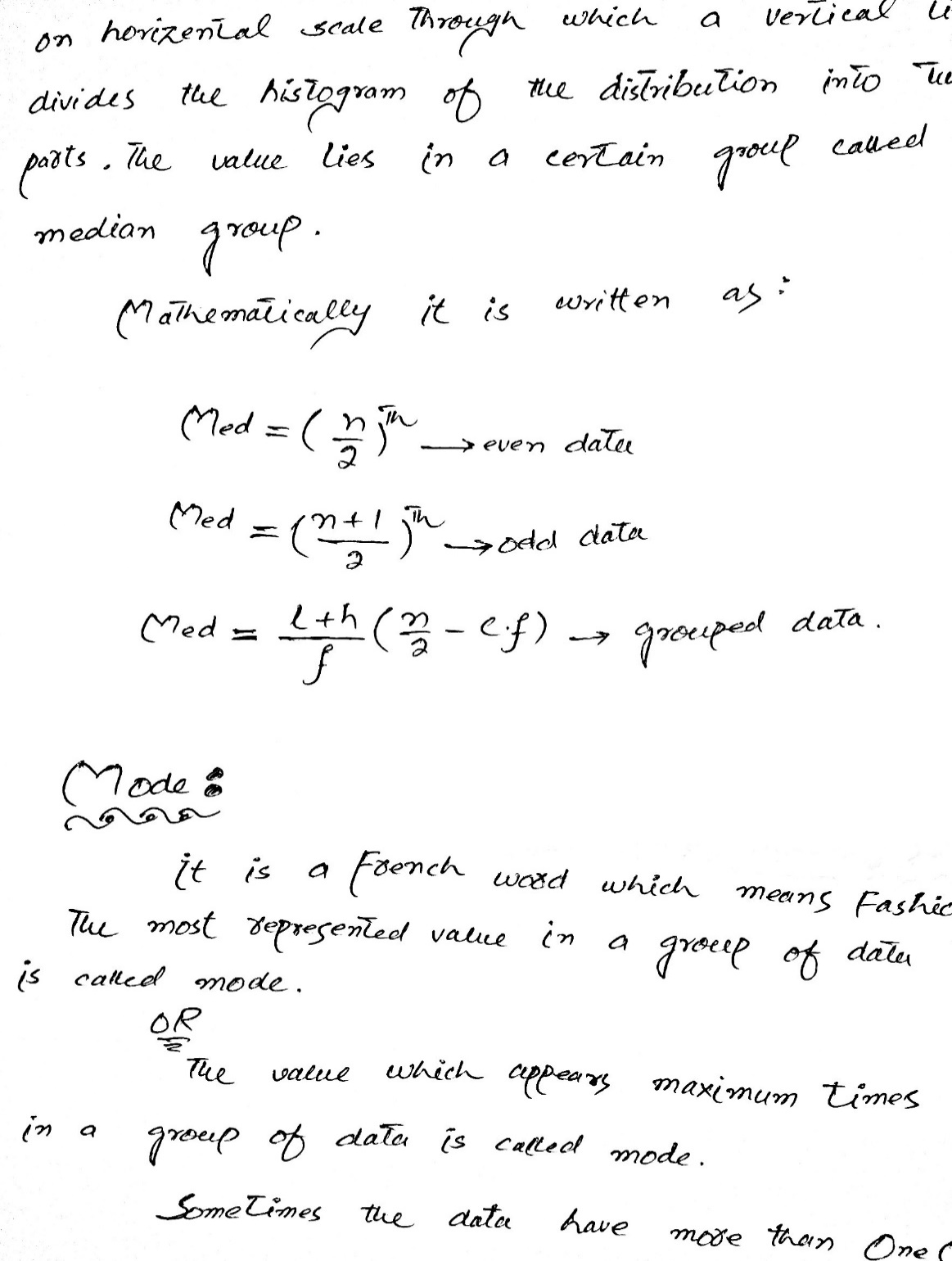
Median can be define” as that median divides a group of ordered data into two equal parts. One part is larger than the middle values and the other part is smaller than the middle values”.

OR

Median divides a group of ordered data into two equal parts, 50% of the data are above the middle values and 50% are below the middle values

The median is calculated for discrete or ungrouped frequency distribution by forming a cumulative frequency distribution.

For frequency distribution the median is a value on horizontal scale through which a vertical line divides the histogram of the distribution into two parts. The values lies in a certain group is called median group

Mathematically it is written as:

**Mode:**

It is a French word which means Fashion.

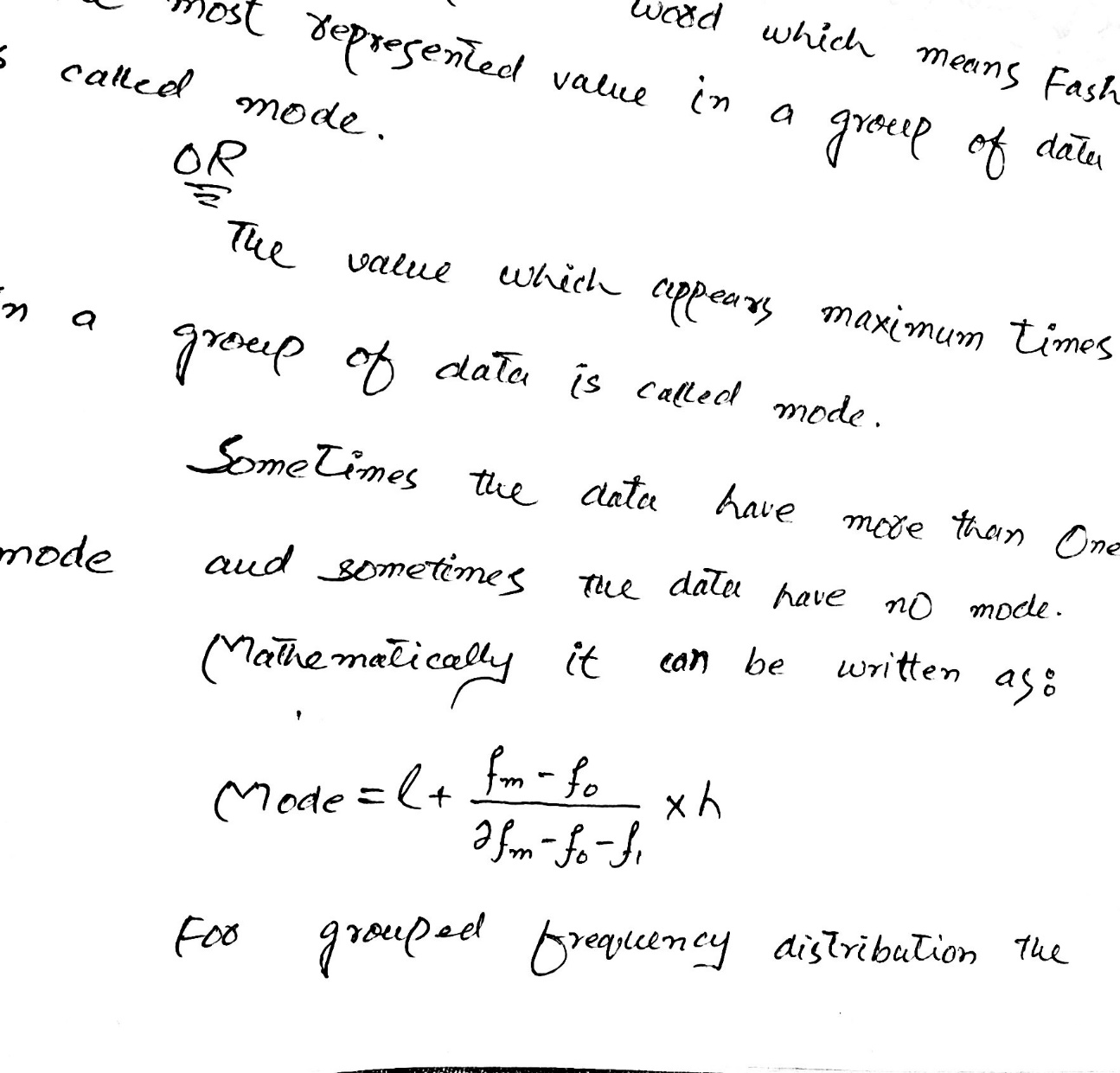
“The most represented values in a group of data is called mode.”

OR

“The values which appears maximum times in a group of data is called mode.”

Sometimes the data have more than one mode and sometimes the data have no mode.

Mathematically it can written as;



For grouped frequency distribution the mode would lies in the class that carries the highest frequency, this class is called model class. A distribution has a single mode is called unimodal distribution, while a distribution with two or more modes is called bimodal or multimodal distribution.

**MERITS AND DEMERITS**

**Arithmetic Mean:**

**Merits:**

* It is rigidly defined.
* It is easy to calculated and simple to understand.
* It is based on all observation.
* It is determined for almost every kind of data.
* It is finite and not indefinite.
* It is ready put to algebraic treatment.
* It is least affected by fluctuation of sampling.

**Demerits:**

* The A.M is highly affected by extreme values.
* It cannot average the rates and percentage property.
* It is not an appropriate average for highly skewed distributions.
* It cannot be computed accurately if a item is missing.
* The mean sometimes does not describe weight any of the observed values.

**Harmonic Mean:**

**Merits:**

* It is based on all observation.
* It cannot be much affected by the fluctuation of sampling.
* It is capable of algebraic treatment.
* It is an appropriate average for averaging ratios and rates.
* It does not give much weight to the larger items.

**Demerits:**

* Its calculation is difficult.
* It gives high weight-age to the small items.
* It cannot be calculated if anyone the item is zero.
* It is usually a value which does not exist in the given data.

**Geometric Mean:**

**Merits:**

* It is rigidly defined and its value is a precise figure.
* It is based on all observation.
* It is capable of further algebraic treatment.
* It is not much affected by fluctuation of sampling.
* It is not affected by extreme values.

**Demerits:**

* It cannot be calculated if any one of the observation is negative or zero.
* Its calculation is rather difficult.
* It is not easy to understand.
* It may not coincide with any of the observation.

**Median:**

**Merits:**

* It is easily calculated and understood.
* It is located even when the values are not capable of quantitative measurement.
* It is not affected by extreme values. It can be computed even when a frequency distribution involves “open-end” classes like those of income and price.
* In a highly skewed distribution, median is an appropriate average to use.

**Demerits:**

* It is not rigorously defined
* It is not capable of lending itself to further statistical treatment.
* It necessitates the arrangement of data into an array which can be tedious and time consuming for a large body of data.

**Mode:**

**Merits:**

* It is simply defined and easily calculated. In many cases, it is extremely easy to locate the mode.
* It is not affected by abnormally large or small observation.
* It can be determined for both the quantitative and the qualitative data.

**Demerits:**

* It is not rigorously defined.
* It is often indeterminate and indefinite.
* It is not based on the entire observation.
* It is not capable of lending itself to further statistical treatment.
* When the distribution consists of a small number of values, the mode may not exist.