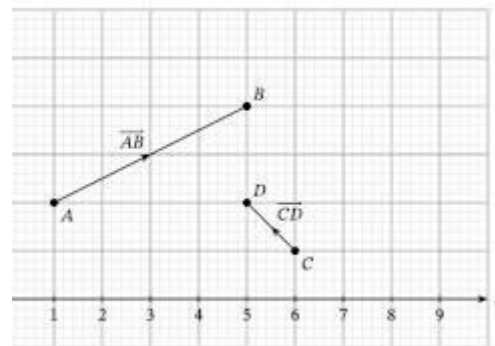


1.

A vector is a collection of elements of the same type, represented as a row or column. For example, a coordinate vector is a collection of three numbers representing the position of a point in three-dimensional space.



2.

A matrix is a collection of vectors, represented as a table. For example, a data matrix could contain the height, weight, and age of a group of individuals.

Code	Station	Latitude (°N)	Longitude (°O)	Altitude (m)
2	Agadir	30.26	9.39	31
3	Casablanca	33.37	7.38	27
1	Eddakhla	23.7	15.96	6
4	El Jadida	33.24	8.24	10
5	Errachidia	31.93	4.47	1039
6	Ifrane	33.32	5.7	2019
7	Khemissat	33.82	6.07	451
14	Marrakech	31.37	8.00	457
8	Meknès	33.54	5.33	531
9	Midelt	32.68	4.75	1462
10	Oujda	34.69	1.92	549
11	Rabat	34.00	6.58	46
12	Safi	32.28	9.24	45
15	Tanger	35.77	5.81	19
13	Taza	34.21	4.01	560

\* CV est le Coefficient de variation en % ( $CV = \frac{\text{Ecart-type}}{\text{Moyenne}}$ ).

3.

A probability is a measure of the likelihood that an event will occur. It is typically expressed on a scale from 0 to 1, where 0 means that the event is impossible and 1 means that it is certain to occur.

Probability law is a mathematical description of the probability of the different possible outcomes of an event.

Examples:

- The probability of drawing an ace from a deck of cards is  $\frac{1}{13}$ .
- The probability of getting a result greater than 7 when rolling two dice is  $\frac{6}{11}$ .

4.

Independent variables are variables whose values do not depend on each other. For example, a person's height does not affect their weight.

5.

An expected value is the mean value of a random variable. It is calculated by adding up all the possible values of a variable and dividing by the number of possible values.

Variance is a measure of the spread of the data around the expected value. It is calculated by adding up the difference between each value and the expected value, squared, and dividing by the number of values.

Standard deviation is the square root of the variance. It measures the magnitude of the fluctuations of the data.

6.

A linear correlation is a measure of the relationship between two variables. It is calculated using the Pearson correlation coefficient.

Pearson correlation coefficient is a number between -1 and 1. A value of 1 indicates a perfect positive linear relationship, a value of -1 indicates a perfect negative linear relationship, and a value of 0 indicates that there is no linear relationship between the two variables.

Examples:

- The linear correlation between a person's height and weight is positive. The taller a person is, the more likely they are to be heavy.
- The linear correlation between the price of a car and its mileage is negative. The more expensive a car is, the less likely it is to have high mileage.

7.

An average is the most common value in a set of data. It is calculated by adding up all the values and dividing by the number of values.

Median is the value that divides a set of data into two equal halves. It is calculated by sorting the data in ascending order and selecting the value in the middle.

Maximum is the highest value in a set of data.

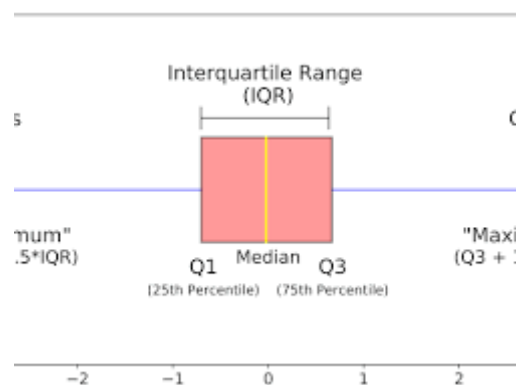
Minimum is the lowest value in a set of data.

8.

Quartiles are values that divide a set of data into four equal parts. The first, second, and third quartiles divide the data set into four equal parts, starting from the lowest to the highest.

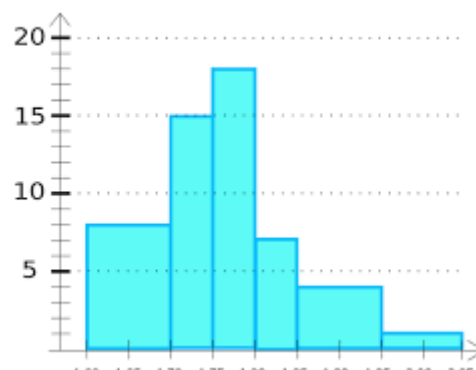
9.

Boxplot is a graph that represents the quartiles of a set of data. It is composed of a box, a vertical line, and outside lines.



10.

Histogram is a graph that represents the distribution of a set of data. It is composed of vertical bars, each bar representing the frequency of a given value.



11.

The Central Limit Theorem is a statistical theorem that states that the distribution of the mean of a large number of independent random variables approaches a normal distribution, regardless of the distribution of the individual random variables.

12.

A derivative is a measure of the change in a function. It is calculated using the limit of a ratio between the difference between two values of the function and the difference between the two points where these values are defined.