Dictionary of the Book

A

Abelian Group (Commutative Group)
A group whose binary operation is commutative, that is ab = ba for each a and b in the group.

Acute Angle
An angle of less than 90°.

Acute Triangle
A triangle each of the whose angle is less than 90°.

Additive function:
Any function f that preserves addition that is $f(x + y) = f(x) + f(y)$.

Additive Identity:
In a mathematical system with an operation of additional denoted + an element o such that $o + e = e + 0 = e$

Additive Inverse
In a mathematical system with an operation of additional denoted +, an additive inverse of an element − e such that $e + (−e) = (−e) + e = 0$

Adjacent angle:
One of a pairs of angles with a common sides formed by two intersecting straight lines.

Adjacent sides:
For a given vertex of a polygon, one of the sides of the polygon that terminates at the vertex.

Adjoint of a Matrix:
The matrix obtained by replacing each element of A with the cofactor of the transposed element.

Altitude:
The perpendicular distance from the base to the top of a geometric figure.

Angular Distance:
For two points, the angle between the lines from a point of observation to the points.

Angular Radius:
For a circle drawn on a sphere, the smaller of the angular distance from one of the two poles of the circle to any point on the circle.

Arc:
A continuous piece of the circumference of the circle.

Arc cosecant:
For a number x, any angle whose cosecant equal x.

Area:
A measure of the size of two dimensional surface or of a region on such a surface.

Arithmetic Mean:
The average of a collection of numbers obtained by dividing the sum of the numbers by the quantity of numbers.

Arithmetic Progression:
A sequence of number of which there is a constant d such that difference between any two successive is equal to d.

Arithmetic Series:
A series whose terms form an arithmetic progression.

Arithmetic sum:
The result of the addition of two or more positive quantities.

Associative Law:
For a binary operation that is designated. the relationship expressed a. (b.c) = (a.b).c

Axis:
In a coordinates system, A line of symmetry for a geometric figure.

B

Base:
A side or face upon which the altitude of a geometric configuration is thought of as being constructed.

Binary Number:
A number expressed in the binary number system of positional notation.

Binary Number System:
A representation for numbers using only the digits 0 and 1 in which successive digits are interpreted as coefficients of successive powers of the base.

Binary Operations:
A rule for combining two elements of a set to obtain a third element of the set.

Bionomial Series (Bionomial expansion):
The expansion $(x + y)^n$, when n is neither a positive integer nor zero.

| **Bionomial Theorem:** | The rule for expanding $(x + y)^n$. |

C

Center:	The point that is equidistant from all the points on a circle.
Column Matrix:	A matrix consisting only one column.
Combination:	A selection of one or more of the elements of a given set without regard to order.
Common difference:	The fixed difference between any term in an arithmetic progression and the proceeding term.
Commutative Law:	A rule which requires that the result of a binary operation be independent of order that is ab = ba.
Complex:	A space which is represented as a union of simplices which intersect only on their faces.
Complex Numbers:	Any number of the form a + bi, where a and b are real numbers.
Composite group:	A group that contains normal subgroup other than the identity elements and the whole group.
Composite Number:	Any positive integer which is not prime.
Conjugate angle:	Two angle whose sum is 360° or 2π.
Constant function:	A function whose value is the same number for all elements of the function domain.
Constant term:	A term that does not contain a variable.
Cramer's Rule:	A method of solving a system of linear equations by means of determinants.

D

| **Determinant:** | A certain – real valued function of the column vector of a square matrix which is zero, if and only if the matrix is singular. |

Diagonal matrix:	A matrix whose non zero entries all like on the principle diagonal.
Digit:	A character used to represent one of the non negative integers smaller than the base of a system of positional notation.
Discriminant:	The quantity $b^2 - 4ac$, where a, b, c are coefficients of a given quadratic polynomial $ax^2 + bx + c$.
Distributive Law:	A rule which stipulates how to binary operations on set shall behave with respect to one another. $$a \cdot (b + c) = (a \cdot b) + (a \cdot c)$$
Domain:	For a function, the set of values of independent variables.

E

Equal set:	Set with precisely the same elements:
Equation:	A statement that each of two expression is equal to the other.
Equidistant:	Being the same distance from some given object.
Equivalent angle:	Two rotation angles that have the same measure.
Even function:	A function with the property that $f(x) = f(-x)$
Even number:	A number which is multiple of 2.
Extract a root:	To determine a root of a given number, usually a positive real root, or a negative real odd root of a negative number.

F

| **Factor:** | For an integer n, any integer which gives n when multiplied by another integer. |

Factorial:	The product of all positive integers less than or equal to n.
Finite group:	A group which contains a finite number of distinct elements.
First quadrant:	The range of angle from 0° to 90°.
Fraction:	An expression which is the product of a real number of complex number with the multiplicative inverse of a real or complex number.
Function:	A mathematical rule between two sets which assigns to each number of the first, exactly one number of the second.

G

Geometric Mean:	The geometric mean of n gives quantities is the nth root of their product.
Geometric Progression:	A sequence which has to form a, ar, ar^2 ....
Geometric Sequence:	A sequence in which the ratio of a term to its predecessor is the same for one term as for any other.
Geometric series:	An infinite series of the form $a + ar + ar^2 + ar^3 + \ldots\ldots$
Geometry:	The qualitative study of shape and size.
Graph:	The planer object, formed from points and line segments between them.
Group:	A set G with an associative binary operation where g_1, g_2 always exist and is an element of G, each g has an inverse element g^{-1}, and G contains an identity element.
Group Theory:	The study of the structure of groups which especially deals with the classification of finite group.

H

Harmonic Mean:	For n positive numbers x_1, x_2,......... x_n, their harmonic mean is the number $\frac{1}{x_1} + \frac{1}{x_2} + \ldots\ldots\ldots + \frac{1}{x_n}$
Harmonic Progression:	A sequence of numbers whose reciprocals form an arithmetic progression.
Harmonic Series:	A series whose terms form a harmonic progression.

I

Identity:	An equation ratifies for all possible choices, of values for the variables Involved.
Identity element:	The unique element e of a group, where g.e. = e.g. = g for every element g of the group.
Identity function:	The function of a set to itself which assign to each element the same element.
Identity Matrix:	The square matrix all of the whose entries are zero except along the principle diagonal where they all are 1.
Imaginary number.	A complex number of the form a + bi, where b not equal to zero.
Imaginary part:	For a complex number x + iy, the imaginary part is the real number Y.
Intersection:	The point or set of points, that is common to two or more.
Inverse:	The additive inverse of a real or complex number a is the number which when added to a given o, the multiplicative inverse of a is the number which when multiplied with a gives 1.

Inverse element:	In a group G the inverse of an element g is the unique element g^{-1} such that $g.g^{-1} = g^{-1}.g = e$.
Inverse function:	An inverse function for a function f is a function g whose domain is the range of f and whose range is the domain of f with the property that both of composed with g and g composed with f give the identity function.
Inverse matrix:	The inverse of non singular matrix A is the matrix A^{-1} where $A.A^{-1} = A^{-1}A = I$.

$$\boxed{\textbf{M}}$$

Mathematical Induction:	A general method of proving statements concerning a positive integral variable, if a statement is proven true for x = 1, and if it is proved that, if the statement is true for x = 1 .... n, then it is true for x = n + 1, it follows that the statement is true for any integer.
Matrix:	A rectangular array of numbers or scalars from a vector space.
Multiplicative Identity:	In a mathematical system with an operation of multiplication denoted "x" an element such that $1 \times e = e \times 1 = e$.
Multiplicative Inverse:	In a mathematical system with an operation of multiplication denoted 'x' the multiplicative inverse of an element e is an element e′ such that $e \times e′ = e′ \times e = 1$, where is the multiplicative identity.

$$\boxed{\textbf{N}}$$

Natural Function:	A trigonometric function as opposed to its logarithm.
Natural Number:	One of the integers 1,2,3,........

Null Matrix:	The matrix all of whose entries are zero.
Null sets:	The empty set, the set which contains no elements.
Number System:	A mathematical system such as the real or complex numbers.

$$\boxed{\textbf{O}}$$

Oblique angle:	An angle that is neither a right angle nor a multiple of right angle.
Obtuse angle:	An angle of more than 90° and less than 180°.
Odd function:	A function f (x) is odd if every f (−x) = − f(x).
Odd Number:	A natural number not divisible by 2.
Order:	A square matrix with n rows and n column has an order n.

$$\boxed{\textbf{P}}$$

Parallelogram:	A four sided polygon with each pair of opposite sides parallel.
Partial fraction:	A collection of fractional which when added are given fractions whose polynomials, the partial fractions are usually constants or linear polynomial divided by the factors of the denominators of the given fraction.
Permutation:	A function which rearranges a finite number of symbols more precisely a one-to-one friction of a finite set onto itself.
Positive Integer:	An integer greater than zero, one of the number 1,2,3,.......
Power Set:	The set consisting of all subsets of a given sets.

Probability:	The probability of an event is the ratio of the number of times it occurs to the large number of trials that take place, the mathematical model of probability is a positive measures which gives the measure of the space the value 1.
Probability Sampling:	A method of Sampling from a finite population where the probability of each set of units being selected is known.
Probability space:	A measure space such that the measure of the entire space equal 1.
Proper subsets:	A set x is proper subset of set y, if there is an element Y which is not in x, while x is a subset of y.
Proposition:	A statement that makes an assertion that is either false or true or has been designated as false or true.

Q

Quadrant:	A quarter of circle.
Quadratic Equation:	Any second degree polynomial equation.
Quadratic formula:	A formula giving the roots of quadratic equation in terms of the coefficients for the equation. $ax^2 + bx + c = 0$, the roots are $$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
Quadratic function:	A function whose value is given by a quadratic polynomial in the independent variable.
Quotient:	The result of dividing one quantity by another.

R

| **Random sampling:** | A sampling from some population where each entry has an equal chance of being drawn. |

Rational function:	A fraction whose numerator and denominator are both rational number.
Rational number:	A number which is the quotient of two integers.
Real Number.	Any number of the real number system.
Real part:	The real part of the complex number $z = x + iy$ is the real number x.
Reflex angel:	An angle greater than 180° and less than 360°.
Remainder theorem:	Dividing a polynomial p (x) by (x – a) gives a remainder equaling the number p (a).
Right angle:	An angle of 90°.
Root:	A root of a given real or complex number is a number which when raised to same exponent equals that number.

S

Sample:	A selection of certain collection from a larger collection.
Sample space:	A concept in probability theory which considered all possible outcomes of an experiment.
Set:	A collection of objects which has the property that given any thing, it can be determined whether or not the thing is in the collection.
Set function:	A relation that assign a value to each number of a collection of sets.
Singular matrix:	A matrix which has no inverse equivalently its determinant is zero.
Square matrix:	A matrix with the same number of rows and columns

Subgroup: A subsets N of a group G which is itself a group relative to the same operations.

Subset: A subset A of a set B is a set all of whose elements are included in B.

Symmetric Matrix: A matrix which equal its transpose.

T

Transpose: The matrix obtained from a given matrix by interchanging its rows and columns

Trigonometry: The study of triangles and the trinometric function:

U

Union: A union of a given family of set is a set consisting of those elements that are members of atleast one set in the family.

Universal set: A set that contains all the elements of concern in the study of particular problem.

V

Variable: A symbol which is used to represent some undetermined element from a given set.

Vertical angle: The two angles produced by a pair of intersecting line and lying on opposite sides of the points intersection.