MICRO-PROJECT REPORT ON

ON

Title:- Roots of Algebraic Expression

Submitted by

Sr no.	Roll No.	Name Of Students
1	61	Thorat Rutuja
2	62	Tope Shivam
3	63	Ukande Utkarsha
4	64	Veer Sayali
5	65	Wagh Sakshi
6	66	Wani Anagha
7	67	Wanjare Samyak
8	68	Zarekar Shubham
9	69	Zope Yash

For the course "Applied Mathematics" Under the guidance of

Mr.U.D.Nimbalkar

Academic Year 2022-2023 Department of Computer

Technology

Government Polytechnic, Ahmednagar.

CERTIFICATE

This is to certify that

Sr no.	Name of Students	Enrollment No.	Roll No.
1.	Thorat Rutuja	**2201300128**	61
2.	Tope Shivam	**2201300129**	62
3.	Ukande Utkarsha	**2201300130**	**63**
4.	Veer Sayali	**2201300131**	64
5.	**Wagh Sakshi**	**2201300132**	**65**
6.	**Wani Anagha**	**2201300133**	**66**
7.	**Wanjare Samyak**	**2201300134**	**67**
8.	**Zarekar Shubham**	**2201300135**	**68**
9.	**Zope Yash**	**2201300136**	**69**

Students of second semester of Diploma in Computer Technology of Institute Government Polytechnic
,Ahmednagar has completed the Micro-project work satisfactorily in course of
Applied Mathematics (22224) for the Academic year 2022-2023.

Subject Teacher   H.O.D   Principal

Mr.U.D.Nimbalkar   Mr.S.D.Muley   Mr.B.M.Kardile

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and thanks for encouraging and supporting and helping us in completing this project successfully We Express our Sincere Gratitude to Prof.S.D.Muley, Head of Dept. Of Computer Technology For his Stimulating Guidance, Continuous Encouragement And supervision throughout the course of present work.

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Aim: Algebra is an interesting and enjoyable branch of mathematics in which numbers, shapes, and letters are used to express problems. Whether you are learning algebra in school or examining a certain test, you will notice that almost all mathematical problems are represented in words.

Therefore, the need to translate written word problems into algebraic expressions arises when we need to solve them.

Introduction: An algebraic expression is a mathematical phrase where variables and constants are combined using the operational (+, -, × & ÷) symbols. An algebraic symbol lacks the equal (=) sign. For example, 10x + 63 and 5x – 3 are examples of algebraic expressions.

Many people interchangeably use algebraic expressions and algebraic equations, unaware that these terms are totally different.

On the other hand, an algebraic is a mathematical phrase where two sides of the phrase are connected by an equal sign (=). For example, 3x + 5 = 20 is an algebraic equation where 20 represents the right-hand side (RHS), and 3x +5 represents the left-hand side (LHS) of the equation.

Types Of Algebraic Expression:

There are several types of algebraic expressions, but the main type includes:

- Monomial algebraic expression

This type of expression has only one term, for example, 2x, 5x ^{2} ,3xy, etc.

- Binomial expression

An algebraic expression having two, unlike terms, for example, 5y + 8, y+5, $6y^3$ + 4, etc.

- Polynomial expression

This is an algebraic expression with more than one term and with non - zero exponents of variables. An example of a polynomial expression is ab + bc + ca, etc.

Other types of algebraic expressions are:

- Numeric Expression:

A numerical expression only consists of numbers and operators. No variable is added in a numeric expression. Examples of numeric expressions are; 2+4, 5-1, 400+600, etc.

- Variable Expression:

This expression contains variables alongside numbers, for example, 6x + y, 7xy + 6, etc.

Explanation of Algebraic Expression:

How to Solve Algebraic Expression?

The purpose of solving an algebraic expression in an equation is to find the unknown variable. When two expressions are equated, they form an equation, and therefore, it becomes easier to solve for unknown terms.

To solve an equation, place the variables on one side and the constants on the other side. You can isolate the variables by applying arithmetic operations like addition, subtraction, multiplication, division, square root, cube root, etc.

An algebraic expression is always interchangeable. This implies that you can rewrite the equation by interchanging the LHS and RHS.

Example 1

Calculate the value of x in the following equation.

$5x + 10 = 50$

<u>Solution</u>

This given equation is $5x + 10 = 50$.

- Isolate the variables and the constants;
- You can keep the variable on the LHS and the constants on the RHS.

$5x = 50-10$

- Subtract the constants;

$5x = 40$

Uses: For a given quadratic equation $ax^2 + bx + c = 0$, the values of x that satisfy the equation are known as its roots. i.e., they are **the values of the variable (x) which satisfies the equation**. The roots of a quadratic function are the x-coordinates of the x-intercepts of the function.

- finding run rate in a cricket match. run rate = x/y where x is number of runs and y is number of overs.
- finding total grocery expenses. Cost = 4a + 5b + 6c. where a b c are prices of different commodities purchased and 3 4 5 are their numbers.
- finding distance travelled by a vehicle.

Without square roots, we could not define the function that gives us a normal distribution curve. This distribution is used throughout mathematics, science, medicine, psychology, and other fields.

Benefits: The physical significance of the roots is that at the roots of an equation, **the graph of the equation intersects x-axis**. The x-axis represents the real line in the Cartesian plane. This means that if the equation has unreal roots, it won't intersect x-axis and hence it cannot be written in factorized form.

just as multiplying two by twelve is faster than counting to 24 or adding 2 twelve times, algebra **helps us solve problems more quickly and easily than we could otherwise**. Algebra also opens up whole new areas of life problems, such as graphing curves that cannot be solved with only foundational math skills.