CBSE Class 8 Maths Notes Chapter 8: CBSE Class 8 Maths Chapter 8 Algebraic Expressions and Identities focuses on helping students understand the formation and manipulation of algebraic expressions, including monomials, binomials, and polynomials.

These notes provide a detailed overview of the concepts, ensuring that students can apply these identities in problem-solving and build a strong foundation in algebra.

CBSE Class 8 Maths Notes Chapter 7 Algebraic Expressions and Identities Overview

These notes on CBSE Class 8 Maths Chapter 8 Algebraic Expressions and Identities are prepared by the subject experts of Physics Wallah. They cover important concepts like how to form algebraic expressions and use key identities.

The notes are written in a simple way to help students understand the topics easily and build a strong base in algebra. With clear explanations and examples these notes are a great resource for learning the chapter.

CBSE Class 8 Maths Notes Chapter 8 Algebraic Expressions and Identities PDF

The PDF link for CBSE Class 8 Maths Notes Chapter 8 Algebraic Expressions and Identities is available below. It is a valuable resource for students providing clear examples and step-by-step solutions to help them grasp the concepts effectively. Access the PDF to enhance your understanding and practice of algebraic expressions and identities.

CBSE Class 8 Maths Notes Chapter 8 Algebraic Expressions and Identities PDF

CBSE Class 8 Maths Notes Chapter 8 Algebraic Expressions and Identities

Here are the notes for CBSE Class 8 Maths Chapter 8 Algebraic Expressions and Identities. Algebraic expressions are combinations of variables, constants, and mathematical operators without an equal sign, unlike equations. These expressions are made up of terms, which are the building blocks.

A term can be a constant, a variable, or a product of both. The factors of a term are the variables or constants that multiply to form that term, and the coefficient is the numerical factor in a term.

Algebraic expressions can be classified into monomials (one term), binomials (two terms), and polynomials (more than two terms). When adding or subtracting algebraic expressions, only like terms—those with the same variables and powers can be combined.

Multiplication of expressions involves using the distributive property, which helps in expanding and simplifying expressions. These concepts are fundamental for solving algebraic problems and understanding the structure of algebraic expressions.

Algebraic Expressions

Algebraic expressions are mathematical phrases that consist of variables, constants, and operators, but they do not include an equal sign or sides like algebraic equations. These expressions represent a value or relationship between variables and constants.

Examples of algebraic expressions are : 2x+4, 7y−3+6x, 3t2+4t−1.

Factors

Factors are the individual variables or constants that, when multiplied together, form a term in an algebraic expression. For example, in the term 8pq, the factors are 8p, and q. Each factor contributes to the overall product that makes up the term.

Factors are considered to be in their simplest form and cannot be broken down or factorized further. They are essential building blocks in constructing algebraic expressions, and understanding them helps in simplifying and manipulating these expressions.

Coefficients

The coefficient of a term is the numerical factor that multiplies the variables within that term. It indicates how many times the variables are being multiplied. For instance, in the term 6y, the coefficient is 6, and in the term 2xy, the coefficient is 2.

Coefficients are crucial in algebra as they determine the weight or magnitude of the variables they are associated with. They play a significant role in simplifying expressions and solving equations.

Like Terms

Like terms are terms in an algebraic expression that share the same variables raised to the same power. These terms have identical algebraic factors, though their numerical coefficients may differ.

For example, 3x2y and 5x2y are like terms.

Monomial

A monomial is an algebraic expression consisting of only one term. It can include constants, variables, or both, but it remains a single, indivisible unit. The term can be a product of numbers and variables, and it is not separated by plus or minus signs. Examples of monomials include:

- 6x: A product of the constant 6 and the variable x.
- 7pq: A product of the constant 7 and the variables p and q.
- 9xyz: A product of the constant 9 and the variables x, y, and z.
- 4bc: A product of the constant 4 and the variables b and c.

Binomial

A binomial is an algebraic expression that contains exactly two unlike terms separated by a plus (+) or minus (−) sign. Each term in a binomial can be a constant, a variable, or a product of variables, but the crucial aspect is that there are only two distinct terms. Examples of binomials include:

- 4y−3z: This binomial consists of two terms, 4y and −3z, connected by a minus sign.
- x6−2: This expression has two terms, x6x -2, connected by a minus sign.
- pq+1: This binomial includes the terms pq and 1, joined by a plus sign.

Polynomial

A polynomial is an algebraic expression that consists of more than two terms, where each term has a non-zero coefficient and variables with non-negative integer exponents. Polynomials are defined by their terms, which can include constants, variables, and products of variables.

The key characteristics of polynomials are that they do not have division by variables and the exponents of the variables are non-negative integers. Examples of polynomials include:

Examples: a+b+c+2, 7xy−8x+2+3y, 5t3−7t+k+3.

Algebraic Identities

- (a+b)2=a2+2ab+b2
- (a−b)2=a2−2ab+b2
- (a+b)(a−b)=a2−b2

Addition and Subtraction of Algebraic Expressions

When adding or subtracting algebraic expressions, it is essential to combine like terms. Like terms are terms that have the same variables raised to the same powers, but may have different numerical coefficients.

To add or subtract algebraic expressions:

1. **Identify Like Terms**: Group terms that have identical variable parts.
2. **Add or Subtract Coefficients**: Combine the numerical coefficients of the like terms.

(3x2y + 4x2y) + (y) + (7a) + (z + 5z) = 7x2y + y + 7a + 6z

Multiplication of Algebraic Expressions

Multiplication of Monomials

When multiplying two monomials, follow these steps:

Multiply Numerical Coefficients: Multiply the numerical coefficients of the monomials to find the new numerical coefficient of the product.

Combine Like Variables: For each variable, add the exponents from both monomials. This results in the new exponent for that variable in the product.

Multiplying two monomials:

- x×3y = x×3×y = 3×x×y = 3xy
- 3x×2y = 3×x×2×y = 3×2×x×y = 6xy
- 5x×(−2z) = 5×(−2)×x×z = −10xz

Multiplying three or more monomials:

- 2x × 3y × 5z = (2x×3y) × 5z = 6xy × 5z = 30xyz
- 4xy × 5x2y2 × 6x3y3 = (4xy×5x2y2) × 6x3y3 = 20x3y3 × 6x3y3 = 120x6y6

Distributive Property of Multiplication

The distributive property of multiplication states that when you multiply a number by a sum or difference, you can distribute the multiplication across each term within the parentheses. This property simplifies algebraic expressions and calculations.

Consider the expression : 6 × (2+4x)
=(6×2) + (6×4x)
=12 + 24x

Multiplication of Polynomials

When multiplying two polynomials, each term in the first polynomial is multiplied by every term in the second polynomial. This process is known as the distributive property and ensures that every term from one polynomial interacts with every term from the other polynomial.

Steps for Multiplying Polynomials:

Distribute Each Term: Multiply each term in the first polynomial by each term in the second polynomial.

Combine Like Terms: After performing the multiplications, combine all the like terms to simplify the resulting polynomial.

Multiplying a binomial by a binomial

$(3a + 4b) \times (2a + 3b)$

$= 3a \times (2a + 3b) + 4b \times (2a + 3b)$

$= (3a \times 2a) + (3a \times 3b) + (4b \times 2a) + (4b \times 3b)$

$= 6a^2 + 9ab + 8ab + 12b^2$

$= 6a^2 + 17ab + 12b^2$

When we multiply a binomial by a trinomial, each of the three terms of the trinomial is multiplied by each of the two terms of the binomial.

Multiplying a binomial by a trinomial

$(p + 4) \times (p^2 + 2p + 3)$

$= p \times (p^2 + 2p + 3) + 4 \times (p^2 + 2p + 3)$

$= (p^3 + 2p^2 + 3p) + (4p^2 + 8p + 12)$

$= p^3 + 6p^2 + 11p + 12$

Benefits of CBSE Class 8 Maths Notes Chapter 8 Algebraic Expressions and Identities

- **Clear Understanding:** The notes provide a clear and structured explanation of algebraic expressions and identities making complex concepts more accessible and easier to understand for Class 8 students.
- **Comprehensive Coverage:** They cover all essential aspects of algebraic expressions, including terms, factors, coefficients, and types of polynomials. This thorough coverage ensures that students grasp the full scope of the topic.
- **Simplified Explanations:** Concepts such as addition, subtraction and multiplication of algebraic expressions are explained in simple terms, aiding in better comprehension and retention of the material.

- **Improved Problem-Solving Skills:** By working through various problems and examples, students develop strong problem-solving skills and become proficient in handling different types of algebraic expressions and identities.
- **Enhanced Preparation:** The notes are designed to align with the CBSE curriculum ensuring that students are well-prepared for exams and assessments. They help in reinforcing classroom learning and boosting exam performance.

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