

Algebraic expressions

Algebraic expression: A combination of constants and variables connected with four fundamental mathematical operations (addition, subtraction, division, multiplication) is called an algebraic expression.

Variables: A quantity which takes different numerical values according to the different condition given in a question is called variables.

Constants: A quantity which has fixed numerical values is called constants

Example: $3y+6y+5$ in which 3, 6 and 5 are constants and y is variable.

Terms: Various parts of an algebraic expressions connected with "+" or "-" sign is called terms.

Example: $2xy+3$ has two terms $2xy$ and 3.

Coefficient: Any factor of a term of an algebraic expression is called coefficient.

Factors: A term of an algebraic expression can be written as a product of one or more numbers and variables. These numbers and variables are called as factors of that term.

Example: $4a+5xy$ the term $5xy$ is the product of factors 5, x and y .

Like terms: Terms which have same variables are called like terms.

Example: $3x, 4xy, 8a, 6x$ in which $3x$ and $6x$ are like terms.

Unlike terms: Terms which which don't have same variables are called unlike terms.

Example: $5z, 7u, 2n, 8i$ all are unlike terms.

Types of Algebraic Expression:

1) Monomial: An algebraic expression which contains only one term is called monomial.

Example: $3x, 7y,$ and $23y^3$ are monomial.

2) Binomial: An algebraic expression which contains exactly two terms is called binomial.

Example: $y+3, 4ab+6b$ are examples of binomial expressions.

3) Trinomial: An algebraic expression which contains exactly three terms is called as trinomial.

Example: $2xy+8u+9p$ is an example of trinomial expression.

4) Polynomial: An algebraic expression which contains more than one term is called as polynomial.

Example: $a-b+6c, 4e+9u-5v+9n,$ all are polynomial.

Degree of a Polynomial:

Highest power of an algebraic expression is known as Degree of a polynomial.

Example: $7a^2b^4+6ab$ degree of the polynomial is $2+4=6$

Addition and Subtraction of an algebraic expression:

Addition and subtraction of an algebraic expression is done only when the terms are like. We cannot add or subtract unlike terms.

Multiplication of algebraic expression:

1) The product of two terms having the same sign is positive, while the product of two terms having the unlike sign is negative.

$$aXb=ab,(-a)X(-b)=ab;aX(-b)=-ab,(-a)Xb=-ab$$

2)if the bases are same powers are added;

$$x^m \times x^n = x^{m+n}$$

Division of Algebraic Expression:

1)The quotient of two numbers having the same sign is positive,while the quotient of two numbers having different sign is negative.

$$a/b=a/b,(-a)/(-b)=a/b;a/(-b)=-(a/b),(-a)/b=-(a/b)$$

Algebraic Identities:An algebraic equation containing a variable,which holds true for any value of that variable is known as algebraic identities.

$$(a+b)^2=a^2+b^2+2ab$$

$$(a-b)^2=a^2+b^2-2ab$$

$$(a-b)(a+b)=a^2-b^2$$