

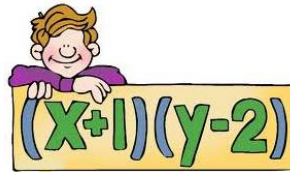
# Algebraic Expressions

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## Introduction

[Algebraic Expressions](#) are expressions which are obtained by performing a finite number of operations like addition, subtraction,

multiplication, rising to a power on symbols ([terms](#)) representing numbers.



Algebraic expressions contain variables and constants. A [variable](#)'s value is not fixed. On the other hand, a [constant](#) has a fixed value.

For Example:  $x^2$ ,  $2y^2$ ,  $3w + 4xy + 5$ ,  $2x^2 + 5x - 7$

## Classification of Expressions

We can classify expressions as follows:

- [Monomial](#)
- [Binomial](#)
- [Trinomial](#)
- [Polynomial](#)

Let's discuss each one of them:

### Monomial

An expression with only one term is called a monomial.

For example:  $2x$ ,  $3xy$ ,  $5x^2y$

### Binomial

An expression with two unlike terms is called a binomial.

For example:  $2x + 1$ ,  $2x + 4y$ ,  $7x^2y + 2x^4$

But  $2x + 3x$  is not a binomial.

As,  $2x + 3x = 5x$  which is monomial.

## Trinomial

An expression which contains three terms is called a trinomial.

For example:  $2x + y + z$ ,  $x^2 + 2x + 2$

## Polynomial

An expression with one or more terms is called a polynomial. A monomial, a binomial and a trinomial all are polynomials.

For example:  $2x$ ,  $x - 5$ ,  $12x^2 - y$

## Addition and Subtraction of Algebraic Expressions

We have two categories under addition and subtraction of algebraic expressions:

- Adding and subtracting like terms
- Adding and subtracting general algebraic expressions

We will learn the concept by taking examples:

### Adding or subtracting like terms

$$\begin{aligned} \text{(i) Add: } & 3y + 5y + 2y \\ &= (3 \times y) + (5 \times y) + (2 \times y) \\ &= (3 + 5 + 2) y \\ &= 10 y \end{aligned}$$

$$\begin{aligned} \text{(ii) Subtract: } & 14 ab - 12 ab \\ &= (14 - 12) ab \\ &= 2 ab \end{aligned}$$

So, from the above examples we conclude the following:

- The sum of two more like terms is a like term with a numerical coefficient equal to the sum of the numerical coefficient of all the like terms.
- The difference of two more like terms is a like term with a numerical coefficient equal to the difference of the numerical coefficient of all the like terms.

### Adding or subtracting general algebraic expression

$$\text{(i) Add: } 13x + 7y + 2x + 6a$$



In the given expression, we have  $13x$  and  $2x$  as like terms. So, we first add them.

$$= 15x + 7y + 6a$$

As there are no like terms left in the above expression, so we get the final answer as  $15x + 7y + 6a$ .

(ii) **Subtract:**  $30xy - 10x - 16y$  from  $15xy + 12y + 14x$ .

First, we will write complete expression as

$$15xy + 12y + 14x - (30xy - 10x - 16y)$$

$$= 15xy + 12y + 14x - 30xy + 10x + 16y \dots(\text{Open the parenthesis})$$

$$= 15xy - 30xy + 12y + 16y + 14x + 10x \dots(\text{Writing like terms together})$$

$$= -15xy + 28y + 24x \dots(\text{Combining like terms})$$

As there are no like terms left in the above expression, so we get the final answer as  $-15xy + 28y + 24x$

Now try it yourself! Should you still need any help, [click here](#) to schedule live online session with e Tutor!

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## **Reference Links:**

- [http://en.wikipedia.org/wiki/Expression\\_\(mathematics\)](http://en.wikipedia.org/wiki/Expression_(mathematics))
- [http://en.wikipedia.org/wiki/Term\\_\(mathematics\)](http://en.wikipedia.org/wiki/Term_(mathematics))
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