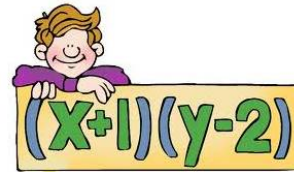# Algebraic Expressions

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Introduction

<u>Algebraic Expressions</u> are expressions which are obtained by performing a finite number of operations like addition, subtraction,

multiplication, rising to a power on symbols (<u>terms</u>) representing numbers.

Algebraic expressions contain variables and constants. A<u>variable</u>'s value is not fixed. On the other hand, a<u>constant</u> 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:

- <u>Monomial</u>
- <u>Binomial</u>
- <u>Trinomial</u>
- <u>Polynomial</u>

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

(i) **Add:** 3y + 5y + 2y
= (3 x y) + (5 x y) + (2 x y)
= (3 + 5 + 2) y
= 10 y

(ii) **Subtract:** 14 ab - 12 ab
= (14 – 12) ab
= 2 ab

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

(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 ....(Open the parenthesis)
= 15xy – 30xy +12y + 16y + 14x + 10x …..(Writing like terms together)
= -15xy + 28y + 24x …..(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/Term_(mathematics)
- http://en.wikipedia.org/wiki/Variable_(mathematics)
- http://en.wikipedia.org/wiki/Constant_%28mathematics%29
- http://en.wikipedia.org/wiki/Monomial
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