

# CLASS NOTES

**Class: VII**

**Topic: Ch 12 ALGEBRAIC EXPRESSIONS**

**Date: 13/07/2020**

**Subject: MATHEMATICS**

## Important points

**Variables** means something that can vary, i. e. change . The value of variable is not fixed. It can take different values. We may use any letter n, l, m, x, y, z etc to show a variable.

**Constants** always have fixed values in the algebraic expressions. They cannot be assumed or changed.

**Algebraic expression** is defined as, numbers, symbols and operators (such as +, -, x and ÷) grouped together that show the value of something.

**Terms** is either a single number or variable, or numbers and variables multiplied together. Terms are separated by + or – signs or sometimes by division.

**Coefficient** any factor of a term of an algebraic expression. For ex. consider the expression  $3xy - 5y + 7$

In term  $3xy$ ,

The numerical coefficient is 3

The literal coefficient is  $xy$

The coefficient of  $x$  is  $3y$

**Like and Unlike terms** the terms having same variable factors are called like terms and the terms having different variable factors are called unlike terms.

Ex  $3xy, 7xy, 100xy, -9xy$  are like terms

$5ab, 5a^2b, 10ab^2$  are unlike terms

**Monomial** an algebraic expression having only one term is called a monomial. Ex  $5x, -3y, 10xy$  etc

**Binomial** an algebraic expression having two (unlike) terms is called a binomial. Ex  $4y + 2$

**Trinomial** an algebraic expression having three (unlike) terms is called a trinomial. Ex  $x + 2y - 9$

**Polynomial** an algebraic expression having one or more terms is called a polynomial

### 1 Get the algebraic expressions in the following cases using variables, constants and arithmetic operations.

S. No.	Statements	Expression
i	Subtraction of $z$ from $y$ .	$y - z$
ii	One-half of the sum of numbers $x$ and $y$ .	$\frac{1}{2}(x + y)$
iii	The number $z$ multiplied by itself.	$z \times z$
v	Numbers $x$ and $y$ both squared and added.	$x^2 + y^2$
viii	Sum of numbers $a$ and $b$ subtracted from their product.	$ab - (a + b)$

### 2 Identify the terms and their factors in the following expressions show the terms and factors by tree diagrams.

<p>a) <math>x - 3</math></p> <p><b>Solution:-</b></p> <p>Expression: <math>x - 3</math></p> <p>Terms: <math>x, -3</math></p> <p>Factors: <math>x; -3</math></p>		<p>(c) <math>y - y^3</math></p> <p><b>Solution:-</b></p> <p>Expression: <math>y - y^3</math></p> <p>Terms: <math>y, -y^3</math></p> <p>Factors: <math>y; -y, -y, -y</math></p>	
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<p><b>(d) <math>5xy^2 + 7x^2y</math></b></p> <p><b>Solution:</b></p> <p>Expression: <math>5xy^2 + 7x^2y</math></p> <p>Terms: <math>5xy^2, 7x^2y</math></p> <p>Factors: 5, x, y, y; 7, x, x, y</p> <div style="text-align: center; margin-top: 10px;"> </div>	<p><b>(e) <math>-ab + 2b^2 - 3a^2</math></b></p> <p><b>Solution:-</b></p> <p>Expression: <math>-ab + 2b^2 - 3a^2</math></p> <p>Terms: <math>-ab, 2b^2, -3a^2</math></p> <p>Factors: -a, b; 2, b, b; -3, a, a</p> <div style="text-align: center; margin-top: 10px;"> </div>
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**(ii) Identify terms and factors in the expressions given below:**

S.No.	Expression	Terms	Factors
a)	$-4x+5$	$-4x$ & 5	$-4, x$ & 5
b)	$-4x+5y$	$-4x$ & $5y$	$-4, x$ & $5, y$
c)	$5y+3y^2$	$5y$ & $3y^2$	$5, y$ & $3, y, y$
d)	$xy+2x^2y^2$	$xy$ & $2x^2y^2$	$x, y$ & $2, x, x, y, y$
f)	$1.2ab-2.4b+3.6a$	$1.2ab, -2.4b$ & $3.6a$	$1.2, a, b, -2.4, b$ & $3.6, a$

**3. Identify the numerical coefficients of terms (other than constants) in the following expressions:**

**Solution:**

S.No.	Expression	Terms	Numerical Coefficient
(i)	$5-3t^2$	$-3t^2$	-3
(ii)	$1 + t + t^2 + t^3$	$t, t^2$ and $t^3$	1, 1 and 1
(iv)	$100m+1000n$	$100m$ and $1000n$	100 and 1000
(vii)	$3.14r^2$	$3.14r^2$	3.14
(viii)	$2(l+b)$	$2l$ and $2b$	2 and 2
(ix)	$0.1y+0.01y^2$	$0.1y$ and $0.01y^2$	0.1 and 0.01

**4. (a) Identify terms which contain x and give the coefficient of x.**

**Solution:**

S.No.	Expression	Terms containing x	Coefficient of x
(i)	$y^2x+y$	$y^2x$	$y^2$
(ii)	$13y^2-8yx$	$-8yx$	$-8y$
(iii)	$x+y+2$	$x$	1
(v)	$1+x+xy$	$x$ and $xy$	1 and $y$
(vii)	$7x+xy^2$	$7x$ and $xy^2$	7 and $y^2$

**(b) Identify terms which contain  $y^2$  and give the coefficient of  $y^2$**

**Solution**

S.No.	Expression	Terms containing $y^2$	Coefficient of $y^2$
(i)	$8-xy^2$	$-xy^2$	$-x$
(iii)	$2x^2y-15xy^2+7y^2$	$-15xy^2$ and $7y^2$	$-15x$ and 7

**5. Classify into monomials, binomials and trinomials.**

**Solution:**

S No.	Expression	No. of terms	Classification
(i)	$4y-7z$	2	Binomial
(ii)	$y^2$	1	Monomial

(iii)	$x+y-xy$	3	Trinomial
(iv)	100	1	Monomial
(v)	$ab-a-b$	3	Trinomial
(vi)	$5-3t$	2	Binomial
(vii)	$4p^2q-4pq^2$	2	Binomial

6 State whether a given pair of terms is of like or unlike terms.

**Solution:**

S.No.	Expression	Like/ Unlike
(i)	1,100	Like
(ii)	$-7x, \frac{5}{2}x$	Like
(iii)	$-29x, -29y$	Unlike
(iv)	14xy, 42yx	Like

7. Identify like terms in the following:

(a)  $-xy^2, -4yx^2, 8x^2, 2xy^2, 7y, -11x^2, -100x, -11yx, 20x^2y, -6x^2, y, 2xy, 3x$

**Solution:** Like terms

$(-xy^2, 2xy^2), (-4yx^2, 20x^2y), (8x^2, -11x^2, -6x^2), (7y, y), (-100x, 3x)$

**Assignment:** left subparts of all the questions

