FACTORISATION

FACTORISATION OF ALGEBRAIC EXPRESSION

INTRODUCTION

In this chapter, we shall do the other way round, that is, we shall find two or more algebraic expressions whose product is equal to the given expression. The process of writing a given algebraic expression as the product of two or more expressions will be known as the factorization of the expression.

FACTORS

If an algebraic expression is written as the product of numbers or algebraic expressions, then each of these numbers and expressions are called the factors of the given algebraic expression and the algebraic expression is called the product of these expressions.

Factorization

The process of writing a given algebraic expression as the product of two or more factors is called factorization.

Factors of a Monomial

Factors of a monomial consist of every literal, their product and number that will divide it exactly.

COMMON FACTORS AND GREATEST COMMON FACTOR OF MONOMIALS

Greatest common factor (GCF) or highest common factor (HCF) :

The greatest common factor of given monomials is the common factor having greatest coefficient and highest power of the variables.

The following step-wise procedure will be helpful to find the GCF of two or more monomials.

CLASS 8

- **Ex.1** Find the greatest common factors of the monomials $14x^2y^3$, $21x^2y^2$, $35x^4y^5z$.
- Sol. The numerical coefficients of the given monomials are 14, 21 and 35 The greatest common factor of 14, 21 and 35 is 7 The common literals appearing in the three monomials are x and y The smallest power of 'x' in the three monomials = 2 The smallest power of 'y' in the three monomials = 2 The monomials of common literals with smallest power = x^2y^2 Hence, the greatest common factor = $7 x^2y^2$.

FACTORISATION OF POLYNOMIALS

CASE I :

When we have an Expression of the type ax + ay

By inspection, we find the greatest monomial factor which can divide each term of the expression.

Ex.2 Factorise
$$3x^2 - 9xy + 12xy^2$$

Sol. $3x^2 = 3 \times x \times x$
 $9xy = 3 \times 3 \times x \times y$
 $12xy^2 = 3 \times 4 \times x \times y \times y$
H.C.F. is $3x$
 $3x^2 - 9xy + 12xy^2 = 3x(x - 3 \times y + 4 \times y \times y)$
 $= 3x(x - 3y + 4y^2)$

Ex.3 Factorise x + 3 - 6xy - 18y

Sol
$$x + 3 - 6xy - 18 y = (x + 3) - 6y (x + 3)$$

= $(x + 3) (1 - 6y)$