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MATHS **FACTORISATION**

Factorization

1. When an algebraic expression is written as the product of two or more expressions, then each of these expressions is called a factor of the given expression.

2. Factorisation of an expression means writing it as a product of its factors. These factors may be numbers, algebraic variables or algebraic expressions.

3. An irreducible factor is a factor which cannot be expressed further as a product of factors.

4. Factorisation using common factor method:

   Step 1: Find the factors of the individual terms of the given expression.
   Step 2: Find out all the common factors between the terms involved.
   (same as finding HCF of terms)
   Step 3: This common factor would be one factor of the given expression. Other factor would be the expression obtained on dividing the given expression by common factor.

5. Rearranging the given expression to a convenient form allows us to form groups leading to factorization. This is regrouping.

6. Factorisation by regrouping terms

   Step 1: Arrange the terms of the given expression in groups in such a way that all the groups have a common factor.
   Step 2: Factorise each group.
   Step 3: Take out the factor which is common to all such groups.

7. Factorisation using following identities:
   i. $a^2 + b^2 + 2ab = (a + b)^2$
   ii. $a^2 + b^2 - 2ab = (a - b)^2$
   iii. $a^2 - b^2 = (a + b)(a - b)$
   iv. $x^2 + (a + b)x + ab = (x + a)(x + b)$
   Method: Express the give expression as the LHS of the identities given above by choosing suitable values of a and b. Using identities, factorise the expression as RHS.

8. Division is inverse process of multiplication.

9. Quotient of two monomials = (quotient of their coefficients) $\times$ (quotient of their variables).

10. While dividing a polynomial by a monomial, divide every term of the polynomial by the monomial. Division of a polynomial by a monomial can also be done by using common factor method and cancelling out the common factors.

11. While dividing a polynomial by a polynomial, we factorise both the polynomials and cancel out their common factors.

12. In division of algebraic expressions, we have
Dividend = Quotient × Divisor + Remainder