

Factorisation – 1

- When we factorise a number(constant) we write it as a product of its prime factors.
- When we factorise an expression we write it as a product of its irreducible factor which may be constant, literal number or algebraic expression.
- An irreducible factor is a factor which cannot be expressed further as a product of factors.

Methods of Factorisation:

➤ By finding common factors:

Example1: Factorise the following

a. $12a^2b + 15ab^2$

$$= (2 \times 2 \times 3) a.a.b + (3 \times 5) a.b.b$$

$$= (3ab)(4a) + (3ab)(5b)$$

$$= 3ab(4a + 5b)$$

b. $10x^2 - 18x^3 + 14x^4$

$$= (2x^2)(5) - (2x^2)(9x) + (2x^2)(7x^2)$$

$$= 2x^2(5 - 9x + 7x^2)$$

➤ By grouping terms:

Example2: Factorise the following

a. $2xy + 3 + 3x + 2y$

$$= 2xy + 2y + 3x + 3$$

$$= [(2y)(x) + (2y)(1)] + [(3)(x) + (3)(1)]$$

$$= 2y(x + 1) + 3(x + 1)$$

$$= (x + 1)(2y + 3)$$

b. $6xy - 4y + 6 - 9x$

$$= [(2y)(3x) - (2y)(2)] + [(3)(2) - (3)(3x)]$$

$$= 2y(3x - 2) + 3(2 - 3x)$$

$$= 2y(3x - 2) - 3(3x - 2)$$

$$= (3x - 2)(2y - 3)$$

Exercise:

1. Factorise the following expressions:

a. $6p - 12p^2$

b. $7a^2 + 14a$

c. $-16z + 20z^2$

d. $5x^3y - 15xy^2$

e. $-4a^2 + 4ab + 4ca$

f. $ax^2y + bxy^2 + cxyz$

g. $x^2yz + xy^2 + xyz^2$

h. $x^2 + xy + 8x + 8y$

i. $ax + bx - ay - by$

j. $15xy - 6x + 5y - 2$

k. $5pq + 15 + 9q + 25p$

l. $z - 7 + 7xy - xyz$