JSUNILTUTORIAL, SAMASTIPUR, BIHAR
Practice Paper   8TH Factorization

What is factorization? The process of expressing any polynomial as a product of its factors is called **factorization**.

A factor that cannot be factorized further is known as **irreducible factor**

$2x^2 + x - 6 = (2x - 3)(x + 2)$, Here **$(2x - 3)$ cannot be factorized further $(x + 2)$ cannot be factorized further.**

1. Factorization by taking out the common factor (by <u>Taking out the common term)</u>

(i) $2x+6$ (ii) $4x^2 + 20xy$ (iii) $3x^2 - 12xy$ (iv) $a^2 b - ab^2$ (v) $3x^3 - 5x^2 + 6x$ (vi) $7x^3 y^3 - 21 xy^2 z + 28x y$

2. Factorization by grouping the terms (In this method, the terms in the given expression can be arranged in groups of two or three so as to get a common factor)

(i) $x^3 - 3x^2 + x - 3$ (ii) $2xy - 3ab + 2bx - 3ay$ (iii) $2m^2 - 10mn 2m 10n$ (iv) $a b (x^2 + 1) + x (a^2 + b^2)$

3. Factorization by using Identities **[**(i) $(a +b)^2 = a^2 + 2ab + b^2$ (ii) $(a - b)^2 = a^2 - 2ab + b^2$ (iii) $(a+ b)(a - b) = a^2 - b^2$**]** Do yourself:

(i) $x^2 + 6x + 9$ (ii) $x^2 - 10x + 25$ (iii) $49m^2 - 56m + 16$ (iv) $x^2 - 64$ (v) $9x^2 y - 4y^3$ (vi) $m^8 - n^8$

4. Factorization by using the Identity $(x + a)(x + b) = x^2 + (a + b) x + a b$ **]**

 Example: $x^2 + 5x + 6 = x^2 + (2+3)x + (2×3) = (x + 2)(x + 3)$

(1) $x^2 + x - 6$ (ii) $x^2 + 6x + 8$ (1) $x^2 - 14x - 45$ (iii) $x^2 + 7x + 12$ (iv) $a^2 + 13a + 12$

<u>Practice Now</u>

1. Factorize the following expressions:

   (i) $3x - 45$ (ii) $7x - 14y$ (iii) $5a^2 + 35a$ (iv) $-12y + 20y^3$

   (v) $15a^2 b + 35ab$ (vi) $pq - pqr$ (vii) $18m^3 - 45mn^2$ (viii) $17l^2 + 85m^2$

   (ix) $6x^3 y - 12x^2 y + 15x^4$ (x) $2a^5 b^3 - 14a^2 b^2 + 4a^3 b$

2. Factorize:

   (i) $2ab + 2b + 3a$ (ii) $6xy - 4y + 6 - 9x$ (iii) $2x + 3xy + 2y + 3y^2$

   (iv) $15b - 3bx^2 - 5b + x^2$ (v) $a^2 x^2 + axy + abx + by$

   (vi) $a^2 x + abx + ac + aby + b^2 y + bc$ (vii) $ax^3 + bx^2 + ax + by$

   (viii) $mx - my - nx + ny$ (ix) $2m^3 + 3m - 2m^2 - 3$ (x) $a^2 + 11b + 11ab + a$

3. Factorize:

   (i) $a^2 + 14a + 49$ (ii) $x^2 - 12x + 36$ (iii) $4p^2 - 25q^2$

   (iv) $25x^2 - 20xy + 4y^2$ (v) $169m^2 - 625n^2$ (vi) $x^2 + \frac{2}{3}x + \frac{1}{9}$

   (vii) $121a^2 + 154ab + 49b^2$ (viii) $3x^3 - 75x$ (ix) $36 - 49x^2$ (x) $1 - 6x + 9x^2$

4. Factorize : (i) $x^2 + 7x + 12$ (ii) $p^2 - 6p + 8$ (iii) $m^2 - 4m - 21$

   (iv) $x^2 - 14x + 45$ (v) $x^2 - 24x + 108$ (vi) $a^2 + 13a + 12$

   (vii) $x^2 - 5x + 6$ (viii) $x^2 - 14xy + 24y^2$ (ix) $m^2 - 21m - 72$