Class 9-Mathematics

Instructions for students: The notes provided must be copied to the Maths copy and then do the homework in the same copy.

Chapter 4

FACTORISATION-Continued

FACTORISATION OF TRINOMIALS

Steps to Factorise trinomial $ax^2 + bx + c$, where a, b and c are real numbers.

Step 1: Split 'b' (the co –efficient of x) in to two real numbers such that the algebraic sum of these two numbers is 'b' and their product is 'ac'.

Step 2: Factorise by grouping method.

Example: Factorise $x^2 + 6x – 7$

b = 6	ac = -7	
7 + -1 =6	7 × -1 = -7	[Split 6 into 7 and -1]
$x^2 + 6x – 7$	$= x^2 + 7x - x – 7$	[Split 6x into 7x and -x]
	$= \underline{x^2 + 7x} \quad \underline{- x – 7}$	[Grouping]
	= x(x + 7) - 1(x + 7)	[factorising each group]
	= (x + 7) (x - 1)	Ans.

Exercise 4.4 (Factorise the following)

3. ii. $a^2 – 3a – 54$

$a^2 – 3a – 54 = a^2 – 9a + 6a – 54$

$= \underline{a^2 – 9a} + \underline{6a – 54}$

$= a (a – 9) + 6 (a – 9)$

$= (a – 9) (a + 6)$ Ans.

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5. i. $6x^2 – 11x – 10$ [b = - 11 ac = 6× -10 = -60]

$6x^2 – 11x – 10 = 6x^2 – 15x + 4x – 10$ [-15 + 4 = -11 & -15× 4 = -60]

$= \underline{6x^2 – 15x} + \underline{4x – 10}$

$= 3x (2x – 5) + 2 (2x – 5)$

$= (2x – 5) (3x + 2)$ Ans.

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9. i. $60x^2 - 70x - 30$

$60x^2 - 70x - 30 = 10(6x^2 - 7x - 3)$

$=10(6x^2 - 9x + 2x - 3)$

$= 10[3x(2x - 3) + 1(2x - 3)]$

$= 10(2x - 3)(3x - 1)$ Ans.

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11. i. $5x^2 + 17xy - 12y^2$ [b = 17 ac = 5 × -12 = -60]

$5x^2 + 17xy - 12y^2 = 5x^2 + 20xy - 3xy - 12y^2$

$= \underline{5x^2 + 20xy} \quad \underline{- 3xy - 12y^2}$

$= 5x(x + 4y) - 3y(x + 4y)$

$= (x + 4y)(5x - 3y)$ Ans.

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13. ii. $(2x - y)^2 - 11(2x - y) + 28$

Let $2x - y$ be 'a'.

$(2x - y)^2 - 11(2x - y) + 28 = a^2 - 11a + 28$

$= a^2 - 7a - 4a + 28$

$= \underline{a^2 - 7a} \quad \underline{- 4a + 28}$

$= a(a - 7) - 4(a - 7)$

$= (a - 7)(a - 4)$

Substituting the value of 'a'

$(2x - y)^2 - 11(2x - y) + 28 = (2x - y - 7)(2x - y - 4)$ Ans.

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15. ii. $a^4 - 11a^2 + 10 = (a^2)^2 - 11a^2 + 10$

Let a^2 be 'y'

$(a^2)^2 - 11a^2 + 10 = y^2 - 11y + 10$

$= y^2 - 10y - y + 10$

$= y(y - 10) - 1(y - 10)$

$= (y - 10)(y - 1)$

Substituting the value of 'y'

$(a^2)^2 - 11a^2 + 10 = (a^2 - 10)(a^2 - 1)$

$= (a^2 - 10)(a + 1)(a - 1)$ Ans.

Home work: Solve the following questions from Exercise 4.4 (Page 100)				
1. ii	3. ii	6. i.	7 ii.	8. i, ii
13 i.	14 ii.	15. i.	16, 17, 18	