

Chapter 8 : Factorisation

Factorise :

1. $(2x - y)^3 - (x + y)^3 + (2y - x)^3$

Ans. $(2x - y)^3 - (x + y)^3 + (2y - x)^3$
 $= (2x - y)^3 + (2y - x)^3 - (x + y)^3$
 $= (2x - y + 2y - x)^3 - 3(2x - y)(2y - x)(2x - y + 2y - x) - (x + y)^3$
 $= (\cancel{x+y})^3 - 3(2x - y)(2y - x)(x + y) - (\cancel{x+y})^3$
 $= -3(2x - y)(2y - x)(x + y)$

2. $a^4 + 6a^3 + 10a^2 + 3a - 6$

Ans. $a^4 + 6a^3 + 10a^2 + 3a - 6$
 $= (a^2)^2 + 2 \cdot a^2 \cdot 3a + (3a)^2 + a^2 + 3a - 6$
 $= (a^2 + 3a)^2 + (a^2 + 3a) - 6$
 $= p^2 + p - 6 \quad [\text{Let } a^2 + 3a = p]$
 $= p^2 + 3p - 2p - 6$
 $= p(p + 3) - 2(p + 3)$
 $= (p + 3)(p - 2)$
 $= (a^2 + 3a + 3)(a^2 + 3a - 2) \quad [\text{putting the value of } p]$

3. **If $2x^2 + px + 6 = (2x - a)(x - 2)$ is an identity then find the value of a and p**

Ans. $2x^2 + px + 6 = (2x - a)(x - 2)$

From equality of the constant terms,

$$(-a)(-2) = 6$$

or, $2a = 6$

or, $a = 3$

From the coefficients of x ,

$$p = (-a) + (-4)$$

or, $p = (-3) + (-4) = -7$

4. If $a^2 - b^2 = 224$ and $a, b (a < b)$ are negative integers then find the value of a and b .

Ans. $a^2 - b^2 = 224$

or, $a^2 - b^2 = 15^2 - 1^2$

$\therefore a^2 = 15^2$ or, $a = \pm 15$ and $b^2 = 1^2$ or, $b = \pm 1$

$\therefore a = -15$ and $b = -1$ (other answers are possible)