

**SECTION – A**

Questions 1 to 6 carry 1 mark each.

1. Factorised form of  $r^2 - 10r + 21$  is  
(a)  $(r - 1)(r - 4)$       (b)  $(r - 7)(r - 3)$       (c)  $(r - 7)(r + 3)$       (d)  $(r + 7)(r + 3)$   
Ans: (b)  $(r - 7)(r - 3)$   
Factorised form of  $r^2 - 10r + 21$  is  $= r^2 - 7r - 3r + 21$   
Take out the common factors,  
 $= r(r - 7) - 3(r - 7)$   
Again take out the common factor,  
 $= (r - 7)(r - 3)$
2. Factorised form of  $p^2 - 17p - 38$  is  
(a)  $(p - 19)(p + 2)$       (b)  $(p - 19)(p - 2)$       (c)  $(p + 19)(p + 2)$       (d)  $(p + 19)(p - 2)$   
Ans: (a)  $(p - 19)(p + 2)$   
Factorised form of  $p^2 - 17p - 38$  is  $= p^2 - 19p + 2p - 38$   
Take out the common factors,  
 $= p(p - 19) + 2(p - 19)$   
Again take out the common factor,  
 $= (p - 19)(p + 2)$
3. On dividing  $p(4p^2 - 16)$  by  $4p(p - 2)$ , we get  
(a)  $2p + 4$       (b)  $2p - 4$       (c)  $p + 2$       (d)  $p - 2$   
Ans: (c)  $p + 2$
4. The factors of  $6xy - 4y + 6 - 9x$  are:  
(a)  $(3x + 2)(2y + 3)$       (b)  $(3x - 2)(2y - 3)$   
(c)  $(3x - 2)(2y + 3)$       (d)  $(3x + 2)(2y - 3)$   
Ans: (b)  $(3x - 2)(2y - 3)$   
 $6xy - 4y + 6 - 9x$   
 $= 6xy - 4y - 9x + 6$   
 $= 2y(3x - 2) - 3(3x - 2)$   
 $= (3x - 2)(2y - 3)$
5. The factors of  $3m^2 + 9m + 6$  are:  
(a)  $(m + 1)(m + 2)$       (b)  $3(m + 1)(m + 2)$   
(c)  $6(m + 1)(m + 2)$       (d)  $9(m + 1)(m + 2)$   
Ans: (b)  $3(m + 1)(m + 2)$   
 $3m^2 + 9m + 6 = 3(m^2 + 3m + 2)$   
 $= 3[m^2 + m + 2m + 2]$   
 $= 3[m(m + 1) + 2(m + 1)]$   
 $= 3[(m + 1)(m + 2)]$
6. The factorisation of  $12x^2y + 15xy^2$  is:

- (a)  $3xy^2(4x + 5y)$       (b)  $3x^2y(4x + 5y)$   
 (c)  $3xy(4x + 5y)$       (d)  $3x^2y^2(4x + 5x)$   
 Ans: (c)  $3xy(4x + 5y)$   
 $12x^2y + 15xy^2 = 3xy(4x + 5y)$

### SECTION – B(CCT Questions)

Questions 7 to 10 carry 1 mark each.

#### CCT Question

One day in Class VIII-B, Kumar sir is explaining the Factorisation by regrouping terms and Factorisation using algebraic identities.

In some algebraic expressions, it is not possible that every term has a common factor. Therefore, to factorise those algebraic expressions, terms having common factors are grouped together.

Algebraic identities can be used for factorisation

**Answer the following questions based on the above information:**

7. Factorised form of  $23xy - 46x + 54y - 108$  is

- (a)  $(23x + 54)(y - 2)$       (b)  $(23x + 54y)(y - 2)$   
 (c)  $(23xy + 54y)(-46x - 108)$       (d)  $(23x + 54)(y + 2)$

Ans: (a)  $(23x + 54)(y - 2)$

8. The factors of  $x^2 - 4$  are

- (a)  $(x - 2)(x - 2)$       (b)  $(x + 2)(x - 2)$       (c)  $(x + 2)(x + 2)$       (d)  $(x - 4)(x - 4)$

Ans: (b)  $(x + 2)(x - 2)$

9. Factorised form of  $xa^2 + xb^2 - ya^2 - yb^2$  is

- (a)  $(x + y)(a^2 + b^2)$       (b)  $(x + y)(a^2 - b^2)$   
 (c)  $(x - y)(a^2 - b^2)$       (d)  $(x - y)(a^2 + b^2)$

Ans: (d)  $(x - y)(a^2 + b^2)$

10. Factorised form of  $(x + 2y)^2 - 4(2x - y)^2$  is

- (a)  $(5x)(4y - 3x)$       (b)  $(x + 2y)(2x - y)$   
 (c)  $(2x - y)(x - 2y)$       (d) none of these

Ans: (a)  $(5x)(4y - 3x)$

### SECTION – C

Questions 11 to 13 carry 2 marks each.

11. Factorise:  $6ab - b^2 + 12ac - 2bc$

Ans: By suitably arranging the terms:

$$6ab - b^2 + 12ac - 2bc = 6ab + 12ac - b^2 - 2bc$$

$$= (6ab + 12ac) - (b^2 + 2bc)$$

$$= 6a(b + 2c) - b(b + 2c)$$

$$= (b + 2c)(6a - b)$$

12. Factorise:  $ab(x^2 + y^2) - xy(a^2 + b^2)$

Ans: We have,  $ab(x^2 + y^2) - xy(a^2 + b^2) = abx^2 + aby^2 - a^2xy - b^2xy$

$$= abx^2 - a^2xy + aby^2 - b^2xy$$

$$= ax(bx - ay) + by(ay - bx)$$

$$= ax(bx - ay) - by(bx - ay)$$

$$= (bx - ay)(ax - by)$$

13. Factorise:  $100 - (x - 5)^2$

Ans: We have,  $100 - (x - 5)^2 = (10)^2 - (x - 5)^2$

$$\begin{aligned}
&= \{10 + (x - 5)\} \{10 - (x - 5)\} \\
&= (10 + x - 5)(10 - x + 5) \\
&= (5 + x)(15 - x)
\end{aligned}$$

## SECTION – D

Questions 14 to 17 carry 3 marks each.

14. Factorise: (i)  $y^2 + 10y + 24$  (ii)  $x^2 + 5x + 6$

$$\begin{aligned}
\text{Ans: (i) } &y^2 + 10y + 24 \\
&= y^2 + 6y + 4y + 24 \\
&= y(y + 6) + 4(y + 6) \\
&= (y + 6)(y + 4) \\
\text{(ii) } &x^2 + 5x + 6 = x^2 + 3x + 2x + 6 \\
&= x(x + 3) + 2(x + 3) \\
&= (x + 3)(x + 2)
\end{aligned}$$

15. Factorise: (i)  $p^2 + 6p - 16$  (ii)  $x^2 - 10x + 24$

$$\begin{aligned}
\text{Ans: (i) } &p^2 + 6p - 16 = p^2 + 8p - 2p - 16 \\
&= p(p + 8) - 2(p + 8) = (p + 8)(p - 2) \\
\text{(ii) } &x^2 - 10x + 24 = x^2 - 6x - 4x + 24 \\
&= x(x - 6) - 4(x - 6) = (x - 6)(x - 4)
\end{aligned}$$

16. Factorise: (i)  $75a^3b^2 - 108ab^4$  (ii)  $256x^3 - 81x$

$$\begin{aligned}
\text{Ans: (i) } &75a^3b^2 - 108ab^4 = 3ab^2 (25a^2 - 36b^2) = 3ab^2 [(5a)^2 - (6b)^2] \\
&\text{By using the formula } (a^2 - b^2) = (a-b)(a+b) \\
&3ab^2 (5a + 6b)(5a - 6b) \\
\text{(ii) } &256x^3 - 81x = x(256x^2 - 81) = x[(16x)^2 - 9^2] \\
&\text{By using the formula } (a^2 - b^2) = (a - b)(a + b) \\
&x(16x - 9)(16x + 9)
\end{aligned}$$

17. Factorise:  $49(a - b)^2 - 25(a + b)^2$

$$\begin{aligned}
\text{Ans: } &49(a - b)^2 - 25(a + b)^2 = [7(a - b)]^2 - [5(a + b)]^2 \\
&\text{By using the formula } (a^2 - b^2) = (a-b)(a+b) \\
&[7(a - b) + 5(a + b)][7(a - b) - 5(a + b)] = (7a - 7b + 5a + 5b)(7a - 7b - 5a - 5b) \\
&= (12a - 2b)(2a - 12b) = 2(6a - b)2(a - 6b) \\
&= 4(6a - b)(a - 6b)
\end{aligned}$$

## SECTION – E

Questions 18 to 20 carry 4 marks each.

18. Factorise the expressions and divide them as directed.

$$\begin{aligned}
\text{(i) } &(y^2 + 7y + 10) \div (y + 5) \\
\text{(ii) } &(m^2 - 14m - 32) \div (m + 2) \\
\text{Ans: (i) } &(y^2 + 7y + 10) \div (y + 5) \\
&(y^2 + 7y + 10) = y^2 + 2y + 5y + 10 = y(y + 2) + 5(y + 2) = (y + 2)(y + 5) \\
&\text{Now, } (y^2 + 7y + 10) \div (y + 5) = (y + 2)(y + 5)/(y + 5) = y + 2 \\
\text{(ii) } &(m^2 - 14m - 32) \div (m + 2) \\
&m^2 - 14m - 32 = m^2 + 2m - 16m - 32 = m(m + 2) - 16(m + 2) = (m - 16)(m + 2) \\
&\text{Now, } (m^2 - 14m - 32) \div (m + 2) = (m - 16)(m + 2)/(m + 2) = m - 16
\end{aligned}$$

19. Factorise. (i)  $a^4 - b^4$  (ii)  $p^4 - 81$

$$\text{Ans: (i) } a^4 - b^4 = (a^2)^2 - (b^2)^2$$

$$\begin{aligned}
&= (a^2 - b^2)(a^2 + b^2) \\
&= (a - b)(a + b)(a^2 + b^2) \\
\text{(ii) } p^4 - 81 &= (p^2)^2 - (9)^2 \\
&= (p^2 - 9)(p^2 + 9) \\
&= (p^2 - 3^2)(p^2 + 9) \\
&= (p - 3)(p + 3)(p^2 + 9)
\end{aligned}$$

**20.** Factorise the following expressions.

(i)  $a^2 + 8a + 16$     (ii)  $p^2 - 10p + 25$     (iii)  $25m^2 + 30m + 9$     (iv)  $49y^2 + 84yz + 36z^2$

Ans: (i)  $a^2 + 8a + 16 = a^2 + 2 \times 4 \times a + 4^2 = (a + 4)^2$

Using the identity  $(x + y)^2 = x^2 + 2xy + y^2$

(ii)  $p^2 - 10p + 25 = p^2 - 2 \times 5 \times p + 5^2 = (p - 5)^2$

Using the identity  $(x - y)^2 = x^2 - 2xy + y^2$

(iii)  $25m^2 + 30m + 9 = (5m)^2 + 2 \times 5m \times 3 + 3^2 = (5m + 3)^2$

Using the identity  $(x + y)^2 = x^2 + 2xy + y^2$

(iv)  $49y^2 + 84yz + 36z^2 = (7y)^2 + 2 \times 7y \times 6z + (6z)^2 = (7y + 6z)^2$

Using the identity  $(x + y)^2 = x^2 + 2xy + y^2$

