

# Factorisation

11. 1

Solution - 1

(i)  $8xy^3 + 12x^2y^2$

H.C.F of  $8xy^3$  and  $12x^2y^2$  is  $4xy^2$

∴ Divide each expression by  $4xy^2$  and keep  $4xy^2$  outside the bracket.

$$\Rightarrow 4xy^2 (2y + 3x)$$

$$\therefore 8xy^3 + 12x^2y^2 = 4xy^2 (2y + 3x)$$

(ii)  $15ax^3 - 9ax^2$

H.C.F of expression  $15ax^3$  and  $9ax^2$  is  $3ax^2$

$$\therefore 15ax^3 - 9ax^2 = 3ax^2 (5x - 3)$$

Solution - 2 :

(i)  $21py^2 - 56py$

H.C.F of  $21py^2$  and  $56py$  is  $7py$ .

$$\therefore 21py^2 - 56py \Rightarrow 7py (3y - 8)$$

(ii)  $4x^3 - 6x^2$

H.C.F of  $4x^3$  and  $6x^2$  is  $2x^2$

$$\therefore 4x^3 - 6x^2 \Rightarrow 2x^2 (2x - 3)$$

Solution - 3

$$(i) \quad 25abc^2 - 15a^2b^2c$$

H.C.F of  $25abc^2$  and  $15a^2b^2c$  is  $5abc$

$$\therefore 25abc^2 - 15a^2b^2c \Rightarrow 5abc(5c - 3ab)$$

$$(ii) \quad x^2yz + xy^2z + xyz^2$$

H.C.F of  $x^2yz$ ,  $xy^2z$  and  $xyz^2$  is  $xyz$ .

$$\therefore xyz(x+y+z)$$

Solution - 4 :

$$(i) \quad 8x^3 - 6x^2 + 10x$$

H.C.F of  $8x^3$ ,  $6x^2$  and  $10x$  is  $2x$

$$\Rightarrow 2x(4x^2 - 3x + 5)$$

$$(ii) \quad 14mn + 22m - 62p$$

H.C.F of  $14mn$ ,  $22m$  and  $62p$  is  $2$

$$\Rightarrow 2(7mn + 11n - 31p)$$

### Solution - 5

$$(i) \quad 18p^2q^3 - 24pq^2 + 30p^2q$$

H.C.F of  $18p^2q^3$ ,  $24pq^2$  and  $30p^2q$  is  $6pq$

$$\Rightarrow 6pq (3pq - 4q + 5p)$$

$$(ii) \quad 27a^3b^3 - 18a^2b^3 + 75a^3b^2$$

H.C.F of  $27a^3b^3$ ,  $18a^2b^3$  and  $75a^3b^2$  is  $3a^2b^2$

$$\Rightarrow 3a^2b^2 (9ab - 6b + 25a)$$

### Solution - 6

$$(i) \quad 15a(2p-3q) - 10b(2p-3q)$$

H.C.F of  $15a(2p-3q)$  and  $10b(2p-3q)$  is  
 $5(2p-3q)$

$$\Rightarrow 5(2p-3q)(3a-2b)$$

$$(ii) \quad 3a(x^2+y^2) + 6b(x^2+y^2)$$

H.C.F of  $3a(x^2+y^2)$  and  $6b(x^2+y^2)$  is  $3(x^2+y^2)$

$$\therefore \Rightarrow 3(x^2+y^2)(a+2b)$$

Solution- 7

$$(i) \quad 6(x+2y)^3 + 8(x+2y)^2$$

H.C.F of  $6(x+2y)^3$  and  $8(x+2y)^2$  is  $2(x+2y)^2$

$$\therefore 2(x+2y)^2 (3(x+2y) + 4)$$

$$\rightarrow 2(x+2y)^2 (3x+6y+4)$$

$$(ii) \quad 14(a-3b)^3 - 21p(a-3b)$$

H.C.F of  $14(a-3b)^3$  and  $21p(a-3b)$  is

$$7(a-3b)$$

$$\therefore \rightarrow 7(a-3b) [2(a-3b)^2 - 3p]$$

Solution- 8 :

$$(i) \quad 10a(2p+q)^3 - 15b(2p+q)^2 + 35(2p+q)$$

H.C.F of  $10a(2p+q)^3$ ,  $15b(2p+q)^2$  and  $35(2p+q)$  is  $5(2p+q)$

$$\rightarrow 5(2p+q)(2a-3b+7)$$

EXERCISE - 11.2

Solution - 1

$$\begin{aligned}(i) \quad & x^2 + xy - x - y \\ \rightarrow & \quad x(x+y) - 1(x+y) \\ \rightarrow & \quad (x+y)(x-1)\end{aligned}$$

$$\begin{aligned}(ii) \quad & y^2 - yz - 5y + 5z \\ \rightarrow & \quad y(y-z) - 5(y-z) \\ \rightarrow & \quad (y-z)(y-5)\end{aligned}$$

Solution - 2

$$\begin{aligned}(i) \quad & 5xy + 7y - 5y^2 - 7x \\ \rightarrow & \quad 5xy - 5y^2 + 7y - 7x \\ \rightarrow & \quad 5xy - 5y^2 - 7x + 7y \\ \rightarrow & \quad 5y(x-y) - 7(x-y) \\ \rightarrow & \quad (x-y)(5y-7)\end{aligned}$$

$$\begin{aligned}(ii) \quad & 5p^2 - 8pq - 10p + 16q \\ & 5p^2 - 10p - 8pq + 16q \\ & 5p(p-2) - 8q(p-2) \\ & (p-2)(5p-8q)\end{aligned}$$

Solution - 3

$$\begin{aligned}
 \text{(i)} \quad & a^2b - ab^2 + 3a - 3b \\
 \Rightarrow & ab(a-b) + 3(a-b) \\
 \Rightarrow & (a-b)(ab+3)
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} \quad & x^3 - 3x^2 + x - 3 \\
 \Rightarrow & x^2(x-3) + 1(x-3) \\
 \Rightarrow & (x-3)(x^2+1)
 \end{aligned}$$

Solution - 4

$$\begin{aligned}
 \text{(i)} \quad & 6xy^2 - 3xy - 10y + 5 \\
 \Rightarrow & 3xy(2y-1) - 5(2y-1) \\
 \Rightarrow & (2y-1)(3xy-5) \\
 \text{(ii)} \quad & 3ax - 6ay - 8by + 4bx \\
 \Rightarrow & 3a(x-2y) + 2b(-2y+x) \\
 \Rightarrow & 3a(x-2y) + 2b(x-2y) \\
 \Rightarrow & (x-2y)(3a+2b)
 \end{aligned}$$

Solution - 5

$$\begin{aligned}(i) \quad & x^2 + xy(1+y) + y^3 \\&\rightarrow x^2 + xy + xy^2 + y^3 \\&\rightarrow x(x+y) + y^2(x+y) \\&\rightarrow (x+y)(x+y^2)\end{aligned}$$

$$\begin{aligned}(ii) \quad & y^2 - xy(1-x) - x^3 \\&\rightarrow y^2 - xy + x^2y - x^3 \\&\rightarrow y(y-x) + x^2(y-x) \\&\rightarrow (y-x)(y+x^2)\end{aligned}$$

Solution - 6

$$\begin{aligned}(i) \quad & ab^2 + (a-1)b - 1 \\&\rightarrow ab^2 + ab - b - 1 \\&\rightarrow ab(b+1) - 1(b+1) \\&\rightarrow (b+1)(ab-1)\end{aligned}$$

$$\begin{aligned}(ii) \quad & 2a - 4b - xa + 2bx \\&\rightarrow 2(a-2b) - x(a-2b) \\&\rightarrow (a-2b)(2-x)\end{aligned}$$

Solution - 7

$$\begin{aligned}
 \text{(i)} \quad & 5ph - 10qk + 2rph - 4qrk \\
 \rightarrow & 5(ph - 2qk) + 2r(ph - 2qk) \\
 \rightarrow & (ph - 2qk)(5 + 2r)
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} \quad & x^2 - x(a+2b) + 2ab \\
 \rightarrow & x^2 - xa - 2bx + 2ab \\
 \rightarrow & x(x-a) - 2b(x-a) \\
 \rightarrow & (x-a)(x-2b)
 \end{aligned}$$

Solution - 8 :

$$\begin{aligned}
 \text{(i)} \quad & ab(x^2+y^2) - xy(a^2+b^2) \\
 \rightarrow & abx^2 + aby^2 - xy a^2 - xy b^2 \\
 \rightarrow & ax(bx - ay) + by(ay - bx) \\
 \rightarrow & ax(bx - ay) - by(bx - ay) \\
 \rightarrow & (bx - ay)(ax - by) \\
 \text{(ii)} \quad & (ax+by)^2 + (bx-ay)^2 \\
 & a^2x^2 + b^2y^2 + 2axy + b^2x^2 + a^2y^2 - 2bxy \\
 \rightarrow & x^2(a^2+b^2) + y^2(a^2+b^2) \\
 \rightarrow & (a^2+b^2)(x^2+y^2)
 \end{aligned}$$

Solution - 9 :

$$\begin{aligned}
 \text{(i)} \quad & a^3 + ab(1-2a) - 2b^2 \\
 \rightarrow & a^3 + ab - 2a^2b - 2b^2 \\
 \rightarrow & a(a^2+b) - 2b(a^2+b) \\
 \rightarrow & (a^2+b)(a-2b)
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} \quad & 3x^2y - 3xy + 12x - 12 \\
 \rightarrow & 3xy(x-1) + 12(x-1) \\
 \rightarrow & (x-1)(3xy+12) \\
 \rightarrow & (x-1) \cdot 3 \cdot (xy+4) \\
 \therefore & 3(x-1)(xy+4)
 \end{aligned}$$

Solution - 10 :

$$\begin{aligned}
 \text{(i)} \quad & a^2b + ab^2 - abc - b^2c + axy + bxy \\
 \rightarrow & (a^2b + ab^2) - (abc + b^2c) + (axy + bxy) \\
 \rightarrow & ab(a+b) - bc(a+b) + xy(a+b) \\
 \rightarrow & (a+b)(ab - bc + xy)
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} \quad & ax^2 - bx^2 + ay^2 - by^2 + az^2 - bz^2 \\
 & a^2(a-b) + y^2(a-b) + z^2(a-b) \\
 & (a-b)(x^2 + y^2 + z^2)
 \end{aligned}$$

Solution - 11

$$(i) \quad x-1 = (x-1)^2 + ax - a$$

$$\Rightarrow 1(x-1) = (x-1)^2 + a(x-1)$$

$$\Rightarrow (x-1)(1-(x-1)+a)$$

$$\Rightarrow (x-1)(1-x+1+a)$$

$$\Rightarrow (x-1)(2-x+a)$$

$$(ii) \quad ax + a^2x + aby + by = (ax+by)^2$$

$$ax + aby + a^2x + aby = (ax+by)^2$$

$$1(ax+by) + a(ax+by) = (ax+by)^2$$

$$(a+by)(1+a-ax-by)$$

EXERCISE - 11.3Solution- 1 :

(i)  $x^2 - 12x + 36$

$\Rightarrow (x)^2 - 2 \cdot 6 \cdot x + (6)^2$

by using  $a^2 - 2ab + b^2 = (a-b)^2$

$\therefore (x-6)^2$

(ii)  $36p^2 - 60pq + 25q^2$

$\Rightarrow (6p)^2 - 2 \cdot 6p \cdot 5q + (5q)^2$

$\Rightarrow (6p - 5q)^2$

(iii)  $9x^2 + 66xy + 121y^2$

$(3x)^2 + 2 \cdot 3x \cdot 11y + (11y)^2$

$\Rightarrow (3x + 11y)^2$

(iv)  $a^4 + 6a^2b^2 + 9b^4$

$(a^2)^2 + 2 \cdot a^2 \cdot 3b^2 + (3b^2)^2$

$\Rightarrow (a^2 + 3b^2)^2$

$$\begin{aligned}
 \text{(v)} \quad & x^2 + \frac{1}{x^2} + 2 \\
 & + (x)^2 + 2 \cdot x \cdot \frac{1}{x} + \left(\frac{1}{x}\right)^2 \\
 & \Rightarrow \left(x + \frac{1}{x}\right)^2
 \end{aligned}$$

$$\begin{aligned}
 \text{(vi)} \quad & x^2 + x + \frac{1}{4} \\
 & = (x)^2 + 2 \cdot x \cdot \frac{1}{2} + \left(\frac{1}{2}\right)^2 \\
 & \Rightarrow \left(x + \frac{1}{2}\right)^2
 \end{aligned}$$

Solution - 2

$$\begin{aligned}
 \text{(i)} \quad & 4p^2 - 9 \\
 & \Rightarrow (2p)^2 - 3^2 \\
 & \text{by using } a^2 - b^2 = (a+b)(a-b) \\
 & \therefore \Rightarrow (2p+3)(2p-3)
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} \quad & 4x^2 - 169y^2 \\
 & \Rightarrow (2x)^2 - (13y)^2 \\
 & \Rightarrow (2x+13y)(2x-13y)
 \end{aligned}$$

Solution - 3

$$(i) \quad 9x^2y^2 - 25$$

$$\Rightarrow (3xy)^2 - 5^2$$

$$\Rightarrow (3xy + 5)(3xy - 5)$$

$$(ii) \quad 16x^2 - \frac{1}{144}$$

$$(4x)^2 - \left(\frac{1}{12}\right)^2$$

$$\Rightarrow \left(4x + \frac{1}{12}\right) \left(4x - \frac{1}{12}\right)$$

Solution - 4 :

$$(i) \quad 20x^2 - 45y^2$$

$$\Rightarrow 5(4x^2 - 9y^2)$$

$$\Rightarrow 5((2x)^2 - (3y)^2)$$

$$\Rightarrow 5(2x + 3y)(2x - 3y)$$

$$(ii) \quad \frac{9}{16} - 25a^2b^2$$

$$\left(\frac{3}{4}\right)^2 - (5ab)^2$$

$$\Rightarrow \left(\frac{3}{4} + 5ab\right) \left(\frac{3}{4} - 5ab\right)$$

Solution - 5

$$\text{(i)} \quad (2a+3b)^2 - 16c^2$$

$$\Rightarrow (2a+3b)^2 - (4c)^2$$

$$\Rightarrow (2a+3b-4c) (2a+3b+4c)$$

$$\text{(ii)} \quad 1 - (b-c)^2$$

$$\Rightarrow 1^2 - (b-c)^2$$

$$\Rightarrow (1+b-c) (1-b+c)$$

Solution - 6 :

$$\text{(i)} \quad 9(x+y)^2 - x^2$$

$$\Rightarrow 3^2(x+y)^2 - x^2$$

$$\Rightarrow (3(x+y))^2 - x^2$$

$$\Rightarrow (3(x+y)+x) (3(x+y)-x)$$

$$\Rightarrow (3x+3y+x) (3x+3y-x)$$

$$\Rightarrow (4x+3y) (2x+3y)$$

$$\text{(ii)} \quad (2m+3n)^2 - (3m+2n)^2$$

$$\Rightarrow (2m+3n+3m+2n) (2m+3n-3m-2n)$$

$$\Rightarrow (5m+5n) (-n-m)$$

Solution - 7

$$(i) \quad 25(a+b)^2 - 16(a-b)^2$$

$$5^2(a+b)^2 - 4^2(a-b)^2$$

$$(5a+5b)^2 - (4a-4b)^2$$

$$\Rightarrow (5a+5b+4a-4b)(5a+5b-4a+4b)$$

$$\Rightarrow (9a-b)(a+9b)$$

$$(ii) \quad 9(3x+2)^2 - 4(2x-1)^2$$

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

$$(9x+6)^2 - (4x-2)^2$$

$$(9x+6+4x-2)(9x+6-4x+2)$$

$$(13x+4)(5x+7)$$

Solution - 8 :-

$$(i) \quad x^3 - 25x$$

$$\star \quad x(x^2 - 25)$$

$$\star \quad x(x^2 - 5^2)$$

$$\star \quad x((x+5)(x-5))$$

$$(i) 63p^2q^2 - 7$$

$$= (9p^2q^2 - 1)$$

$$= ((3pq)^2 - 1^2)$$

$$= ((3pq+1)(3pq-1))$$

Solution - 9

$$(i) 32a^2b - 72b^3$$

$$8b(4a^2 - 9b^2)$$

$$8b((2a)^2 - (3b)^2)$$

$$8b((2a+3b)(2a-3b))$$

$$(ii) 9(a+b)^3 - 25(a+b)$$

$$(a+b)((3^2(a+b)^2) - 5^2)$$

$$(a+b)((3a+3b)^2 - 5^2)$$

$$(a+b)(3a+3b+5)(3a+3b-5), //$$

Solution - 10

(i)  $x^2 - y^2 - 2y - 1$

$\Rightarrow x^2 - (y^2 + 2y + 1)$

$a^2 + b^2 + 2ab = (a+b)^2$

$\Rightarrow x^2 - (y+1)^2$

$(a+b)(a-b) = a^2 - b^2$

$\Rightarrow (x+y+1)(x-y-1)$

(ii)  $p^2 - 4pq + 4q^2 - r^2$

$\Rightarrow (p^2 - 2 \cdot p \cdot 2q + (2q)^2) - r^2$

$\Rightarrow (p+2q)^2 - r^2$

$\Rightarrow (p+2q+r)(p+2q-r)$

Solution - 11

(i)  $9x^2 - y^2 + 4y - 4$

$\Rightarrow (3x)^2 - (y^2 - 2 \cdot y \cdot 2 + 2^2)$

$\Rightarrow (3x)^2 - (y-2)^2$

$\Rightarrow (3x+y-2)(3x-y+2)$

(ii)  $4a^2 - 4b^2 + 4a + 1$

$\Rightarrow (2a)^2 + 2 \cdot 2a \cdot 1 + 1^2 - (2b)^2$

$\Rightarrow (2a+1)^2 - (2b)^2$

$\Rightarrow (2a+1+2b)(2a+1-2b)$

Solution-12 :

$$\begin{aligned}
 \text{(i)} \quad & 625 - p^4 \\
 \rightarrow & (25)^2 - (p^2)^2 \\
 \rightarrow & (25 + p^2)(25 - p^2)
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} \quad & 5y^5 - 405y \\
 \rightarrow & 5y(y^4 - 81) \\
 \rightarrow & 5y((y^2)^2 - 9^2) \\
 \rightarrow & 5y(y^2 + 9)(y^2 - 9)
 \end{aligned}$$

Solution-13 :

$$\begin{aligned}
 \text{(i)} \quad & x^4 - y^4 + x^2 - y^2 \\
 \rightarrow & (x^4 - y^4) + (x^2 - y^2) \\
 \rightarrow & ((x^2)^2 - (y^2)^2) + (x^2 - y^2) \\
 \rightarrow & (x^2 + y^2)(x^2 - y^2) + (x^2 - y^2) \\
 \rightarrow & (x^2 - y^2)(x^2 + y^2 + 1)
 \end{aligned}$$

49

$$\begin{aligned} \text{(ii)} \quad & 64a^2 - 9b^2 + 42bc - 49c^2 \\ \Rightarrow & (8a)^2 - (3b)^2 + 7c(6b - 7c) \\ \Rightarrow & (8a + 3b)(8a - 3b) + 7c(6b - 7c) \end{aligned}$$

### EXERCISE - 11.4

#### Solution - 1

$$(i) \quad x^2 + 3x + 2$$

$$1 \times 2 = \begin{array}{c} 2 \\ / \quad \backslash \\ +2 \quad +1 \end{array}$$

$$\Rightarrow x^2 + 2x + x + 2$$

$$\Rightarrow x(x+2) + 1(x+2)$$

$$\Rightarrow (x+1)(x+2).$$

$$(ii) \quad z^2 + 10z + 24$$

$$1 \times 24 = \begin{array}{c} 2 \quad 4 \\ / \quad \backslash \\ +6 \quad +4 \end{array}$$

$$\Rightarrow z^2 + 6z + 4z + 24$$

$$\Rightarrow z(z+6) + 4(z+6)$$

$$\Rightarrow (z+6)(z+4).$$

#### Solution - 2 :

$$(i) \quad y^2 - 7y + 12$$

$$1 \times 12 = \begin{array}{c} 1 \quad 2 \\ / \quad \backslash \\ -4 \quad -3 \end{array}$$

$$\Rightarrow y^2 - 4y - 3y + 12$$

$$\Rightarrow y(y-4) - 3(y-4)$$

$$\Rightarrow (y-4)(y-3)$$

$$(ii) \quad m^2 - 23m + 42$$

$$1 \times 42 = \begin{array}{c} 9 \quad 2 \\ / \quad \backslash \\ -21 \quad -2 \end{array}$$

$$\Rightarrow m^2 - 21m - 2m + 42$$

$$\Rightarrow m(m-21) - 2(m-21)$$

$$\Rightarrow (m-21)(m-2)$$

Solution - 3

(i)  $y^2 - 5y - 24$

$\rightarrow y^2 - 8y + 3y - 24$

$\rightarrow y(y-8) + 3(y-8)$

$\rightarrow (y-8)(y+3)$

$$\begin{array}{r} 1 \times 24 = 24 \\ \diagup \quad \diagdown \\ -8 \quad +3 \end{array}$$

(ii)  $t^2 + 23t - 108$

$t^2 + 27t - 4t - 108$

$t(t+27) - 4(t+27)$

$(t+27)(t-4)$

$$\begin{array}{r} 1 \times 108 = 108 \\ \diagup \quad \diagdown \\ 27 \quad -4 \end{array}$$

Solution - 4 :

(i)  $3x^2 + 14x + 8$

$3x^2 + 12x + 2x + 8$

$3x(x+4) + 2(x+4)$

$(x+4)(3x+2)$

$$\begin{array}{r} 3 \times 8 = 24 \\ \diagup \quad \diagdown \\ 12 \quad 2 \end{array}$$

(ii)  $3y^2 + 10y + 8$

$3y^2 + 6y + 4y + 8$

$3y(y+2) + 4(y+2)$

$(y+2)(3y+4)$

$$\begin{array}{r} 3 \times 8 = 24 \\ \diagup \quad \diagdown \\ +6 \quad +4 \end{array}$$

Solution-5 :

(i)  $14x^2 - 23x + 8$

$14 \times 8 = 112$

$14x^2 - 16x - 7x + 8$

$$\begin{array}{r} 14 \\ \diagup \quad \diagdown \\ -16 \quad -7 \end{array}$$

$2x(7x-8) - 1(7x-8)$

(ii)  $12x^2 - x - 35$

$12 \times 35 = 420$

$12x^2 - 21x + 20x - 35$

$$\begin{array}{r} 12 \\ \diagup \quad \diagdown \\ -21 \quad +20 \end{array}$$

$3x(4x-7) + 5(4x-7)$

$(4x-7)(3x+5)$

Solution-6 :

(i)  $6x^2 + 11x - 10$

$6 \times 10 = 60$

$6x^2 + 15x - 4x - 10$

$$\begin{array}{r} 15 \\ \diagup \quad \diagdown \\ 15 \quad -4 \end{array}$$

$3x(2x+5) - 2(2x+5)$

$(2x+5)(3x-2)$

(ii)

$5 - 4x - 12x^2$

$5 \times 12 = -60$

$5 - 10x + 6x - 12x^2$

$$\begin{array}{r} -10 \\ \diagup \quad \diagdown \\ -10 \quad +6 \end{array}$$

$5(1-2x) + 6x(1-2x)$

$(1-2x)(5+6x)$

Solution - 7

(i)  $1 - 18y - 63y^2$

$1x - 63 = -63$

$1 - 21y + 3y - 63y^2$

$\begin{array}{r} -21 \\ \diagup \quad \diagdown \\ -21 \quad +3 \end{array}$

$1(1 - 21y) + 3y(1 - 21y)$

$(1 - 21y)(1 + 3y)$

(ii)

$3x^2 - 5xy - 12y^2$

$3x^2 = -36$

$3x^2 - 9xy + 4xy - 12y^2$

$\begin{array}{r} -9 \\ \diagup \quad \diagdown \\ -9 \quad +4 \end{array}$

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

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

Solution - 8 :

(i)  $x^2 - 3xy - 40y^2$

$1x - 40 = -40$

$x^2 - 8xy + 5xy - 40y^2$

$\begin{array}{r} -8 \\ \diagup \quad \diagdown \\ -8 \quad +5 \end{array}$

$x(x - 8y) + 5y(x - 8y)$

$(x - 8y)(x + 5y)$

(ii)  $10p^2q^2 - 21pq + 9$

$10x^2 = 90$

$10p^2q^2 - 15pq - 6pq + 9$

$\begin{array}{r} -15 \\ \diagup \quad \diagdown \\ -15 \quad -6 \end{array}$

$5pq(2pq - 3) - 3(2pq - 3)$

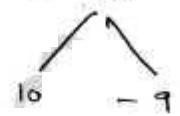
$(2pq - 3)(5pq - 3)$

Solution-9

(i)  $2a^2b^2 + ab - 45$

$2 \times 45 = 90$

$2a^2b^2 + 10ab - 9ab - 45$



$2ab(ab+5) - 9(ab+5)$

(ii)  $x(12x+7) - 10$

$12 \times 10 = -120$

$12x^2 + 15x - 8x - 10$



$3x(4x+5) - 2(4x+5)$

$(4x+5)(3x-2)$

Solution-10

(i)  $(a+b)^2 - 11(a+b) - 42$

$1 \times 42 = -42$

$(a+b)^2 - 14(a+b) + 3(a+b) - 42$



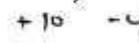
$(a+b)(a+b-14) + 3(a+b-14)$

$(a+b-14)(a+b+3)$

(ii)  $8 + 6(p+q) - 5(p+q)^2$

$8 \times -5 = -40$

$8 + 10(p+q) - 4(p+q) - 5(p+q)^2$



$2(4 + 5(p+q)) - (p+q)(4 + 5(p+q))$

$(4 + 5(p+q))(2 - (p+q))$

Solution-11

$$(i) \quad (x-2y)^2 - 6(x-2y) + 5 \quad (x^2 = 5)$$

$$(x-2y)^2 - 5(x-2y) - (x-2y) + 5$$

$$(x-2y)(x-2y-5) - 1(x-2y-5)$$

$$(x-2y-5)(x-2y-1)$$

$$(ii) \quad 7 + 10(2x-3y) - 8(2x-3y)^2 \quad 7+8 = -5 \quad 6$$

$$7 + 14(2x-3y) - 4(2x-3y) - 8(2x-3y)^2$$

$$7 \left( 1 + 2(2x-3y) \right) - 4(2x-3y) \left( 1 + 2(2x-3y) \right)$$

$$\left( 1 + 2(2x-3y) \right) \left( 7 - 4(2x-3y) \right)$$

$$(1 + 4x - 6y) \quad (7 - 8x + 12y)$$

### EXERCISE - 11.5

#### Solution - 1

$$(i) \quad (35x + 28) \div (5x + 4)$$

$$\Rightarrow \frac{35x + 28}{5x + 4}$$

$$\Rightarrow \frac{7(5x + 4)}{5x + 4}$$

$$\Rightarrow \underline{\underline{7}}$$

$$(ii) \quad 7pq^2(9x - 21) \div 63pq(x - 3)$$

$$\Rightarrow \frac{7pq^2(9x - 21)}{63pq(x - 3)}$$

$$\Rightarrow \frac{7 \cancel{p} q^{1/2} \cancel{x}(x \cancel{- 3})}{63 \cancel{p} q \cancel{(x - 3)}}$$

$$\Rightarrow pq$$

#### Solution - 2 :

$$(i) \quad 6(2x + 7)(5x - 3) \div 3(5x - 3)$$

$$\Rightarrow \frac{2(2x + 7)(5x - 3)}{3(5x - 3)}$$

$$\Rightarrow 2(2x + 7)$$

$$\Rightarrow 4x + 14$$

$$(ii) \quad 33pq(p+3)(2q-5) \div 11p(2p-5)$$

$$\rightarrow \frac{33pq(p+3)(2q-5)}{11pq(2q-5)}$$

$$\rightarrow 3(p+3)$$

$$\rightarrow 3p+9.$$

Solution - 3

$$(i) \quad (7x^3 - 63x) \div 7(x-3)$$

$$\rightarrow \frac{7x^3 - 63x}{7(x-3)}$$

$$\rightarrow \frac{x(x^2 - 9)}{x(x-3)}$$

$$\rightarrow \frac{x\underline{(x^2 - 3^2)}}{x-3}$$

$$\rightarrow \frac{x(x+3)(x-3)}{\cancel{(x-3)}}$$

$$\rightarrow x(x+3)$$

$$\rightarrow x^2 + 3x$$

$$(ii) (3p^2 + 17p + 10) \div (p+5)$$

$$\rightarrow \frac{3p^2 + 17p + 10}{p+5}$$

$$3 \times 10 = 30$$

15      2

$$\rightarrow \frac{3p^2 + 15p + 2p + 10}{p+5}$$

$$\rightarrow \frac{3p(p+5) + 2(p+5)}{p+5}$$

$$\rightarrow \frac{(p+5)(3p+2)}{(p+5)}$$

$$\rightarrow 3p+2$$

$$(iii) 10xy(14y^2 + 43y - 21) \div 5x(7y - 3)$$

$$\rightarrow \frac{10xy(14y^2 + 43y - 21)}{5x(7y - 3)} \quad . \quad 14 \times 21 = 294$$

-6      49

$$\rightarrow \frac{2y(14y^2 - 6y + 49y - 21)}{7y - 3}$$

$$\rightarrow \frac{2y(2y(7y - 3) + 7(7y - 3))}{7y - 3}$$

$$\rightarrow \frac{2y(7y - 3)(2y + 7)}{(7y - 3)}$$

$$\rightarrow 2y(2y + 7) //$$

$$(iv) \frac{12pq\cancel{r}(6p^2 - 13pq + 6q^2)}{6pq(2p - 3q)} \div 6pq(2p - 3q)$$

$$\rightarrow \frac{12pq\cancel{r}(6p^2 - 13pq + 6q^2)}{6pq(2p - 3q)}$$

$$\Rightarrow \frac{2\cancel{r}(6p^2 - 9pq - 4pq + 6q^2)}{2p - 3q}$$

$$\Rightarrow \frac{2\cancel{r}(3p(2p - 3q) - 2q(2p - 3q))}{2p - 3q}$$

$$\Rightarrow \frac{2\cancel{r}(2p - 3q)(3p - 2q)}{(2p - 3q)}$$

$$\therefore 2\cancel{r}(3p - 2q)$$