



SpeedLabs

MATHS

ICSE 8th

TEEVRA EDUTECH PVT. LTD.

1. Factorize

(i) $5xy + 20x - 9y - 36$

Ans. $5xy + 20x - 9y - 36$
 $= 5x(y + 4) - 9(y + 4)$
 $= (y + 4)(5x - 9)$

(ii) $(ax + by)^2 + (bx - ay)^2$

Ans. $= a^2x^2 + b^2y^2 + 2abxy + b^2x^2 + a^2y^2 - 2abxy$
 $= a^2x^2 + b^2y^2 + b^2x^2 + a^2y^2$
 $= a^2(x^2 + y^2) + b^2(x^2 + y^2)$
 $= (x^2 + y^2)(a^2 + b^2)$

(iii) $x - 1 - (x - 1)^2 + 4 - 4x$

Ans. $x - 1 - (x - 1)^2 + 4 - 4x$
 $= (x - 1)(1 - (x - 1)) - 4(x - 1)$
 $= (x - 1)(1 - x + 1 - 4)$
 $= (x - 1)(-x - 2)$
 $= (1 - x)(x + 2)$

(iv) $x - 2 - (x - 2)^2 + ax - 2a$

Ans. $x - 2 - (x - 2)^2 + ax - 2a$
 $= (x - 2)[1 - (x - 2)] + a(x - 2)$
 $= (x - 2)(1 - x + 2 - a)$
 $= (x - 2)(3 - x - a)$

(v) $a^2b^2 + b^2 + a^2 + 1$

Ans. $a^2b^2 + b^2 + a^2 + 1$
 $= b^2(a^2 + 1) + (a^2 + 1)$
 $= (a^2 + 1)(b^2 + 1)$

2. Factorize

(i) $x^2 - 81$

Ans. $=(x-9)(x+9)$

(ii) $36y^2 - 121$

Ans. $=(6y-11)(6y+11)$

(iii) $(a+b^2)-36$

Ans. $=(a+b-6)(a+b+6)$

(iv) $\frac{9}{16} - 25x^2$

Ans. $=(\frac{3}{4}-5x)(\frac{3}{4}+5x)$

(v) $(3m-n)^2 - (m-2n)^2$

Ans $=[(3m-n)-(m-2n)][(3m-n)+(m-2n)]$

$$=(3m-n-m+2n)(3m-n+m-2n)$$

$$=(2m+n)(4m-3n)$$

(vi) $(a-b)^2 - 25(a+b)^2$

Ans. $=[6(a-b)-5(a+b)][6(a-b)+5(a+b)]$

$$=(6a-6b-5a-5b)(6a-6b+5a+5b)$$

$$=(a-11b)(11a-b)$$

(vii) $16a^4 - 81b^4$

Ans. $=(4a^2 - 9b^2)(4a^2 + 9b^2)$

$$=(2a-3b)(2a+3b)(4a^2+9b^2)$$

(viii) $9(x+y)^3 - 16(x+y)$

Ans. $=(x+y)[9(x+y)^2 - 16]$

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

(ix) $x^2 - y^2 - 8yz - 16z^2$

Ans. $=x^2 - (y^2 + 8yz + 16z^2)$

$$=x^2 - (y+4z)^2$$

$$=(x-y-4z)(x+y+4z)$$

(x) $324x^4 - 0.0064b^4$

Ans. $= 1/1000(324x^4 - 64b^4)$
 $= 4/100(81x^4 - 16b^4)$
 $= 4/100(9x^2 - 4b^2)(9x^2 + 4b^2)$
 $= 0.0004(3x - 2b)(3x + 2b)(9x^2 + 4b^2)$
or $(0.09x^2 + 0.04b^2)(0.3x + 0.2b)(0.3x - 0.2b)$

3. Factorize

(i) $82^2 - 18^2$

Ans. $= (82 + 18)(82 - 18) = 100 \times 64 = 6400$

(ii) $(6\frac{4}{11})^2 - (4\frac{7}{11})^2$

Ans. $= (6\frac{4}{11} + 4\frac{7}{11})(6\frac{4}{11} - 4\frac{7}{11}) = 11 \times 1\frac{4}{11} = 19$

(iii) $\frac{(7.3 \times 7.3 - 2.7 \times 2.7)}{(7.3 - 2.7)}$

Ans. $= \frac{(7.3 + 2.7)(7.3 - 2.7)}{(7.3 - 2.7)} = 10$

4. Factorize the following:

(i) $9q^4r^4 - 6p^4q^2r^2 + p^8$

Ans. $= (3q^2r^2 - p^4)^2$

(ii) $\frac{9p^2}{q^2} + \frac{16r^2}{m^2} + \frac{24pr}{qm}$

Ans. $= (\frac{3p}{q} + \frac{4r}{m})^2$

(iii) $\frac{1}{4}z^6 + 9a^2 - 3az^3$

Ans. $= (\frac{1}{2}z^3 - 3a)^2$

(iv) $\frac{9}{4}a^2 + \frac{49}{9}p^2 - 7ap$

Ans. $=\left(\frac{3}{2}a - \frac{7}{3}p\right)^2$

5. $t^2 + 22t + 85 = 0$ Find two numbers with sum = 22 and product = 85.

Ans. $a + b = 22$

$$ab = 85$$

Two numbers are 17, 5

Hence the factors are $t^2 + 22t + 85 = (t + 17)(t + 5)$

6. $3x^2 + 11x + 10$ Find two numbers with sum = 11 and product = 30.

Ans. $a + b = 11$

$$ab = 30$$

$$a = 5, b = 6$$

Therefore $3x^2 + 11x + 10 = 3x^2 + 6x + 5x + 10$
 $= 3x(x + 2) + 5(x + 2)$
 $= (3x + 5)(x + 2)$

7. $72 - x - x^2$ Find two numbers with sum = -1 and product = -72.

Ans. $a + b = -1$

$$ab = -72$$

$$a = -8, b = -9$$

Therefore $72 - x - x^2 = -x^2 - 9x + 8x + 72$
 $= -x(x - 8) - 9(x - 8)$
 $= (-x - 9)(x - 8)$
 $= (x + 9)(8 - x)$

8. $(a - b)^2 - 5(a - b) + 6$

Ans. Let $a - b = x$

Hence $(a - b)^2 - 5(a - b) + 6 = x^2 - 5x + 6 = (x - 2)(x - 3)$

Substituting Back

$$= (a - b)^2 - 5(a - b) + 6 = (a - b - 2)(a - b - 3)$$

9. $3(y - 2)^2 - (y - 2) - 44$

Ans. Let $(y - 2) = x$

$$= 3x^2 - x - 44 = 3x^2 - 12x + 11x - 44$$

$$= 3x(x - 4) + 11(x - 4)$$

$$=(3x+11)(x-4)$$

Substituting Back

$$=(3(y-2)+11)(y-2-4)$$

$$=(3y+5)(y-6)$$

10. $7+10(x+y)-8(x+y)^2$

Ans. Let $(x+y) = a$

Therefore, we have

$$=7+10a-8a^2$$

$$m+n=10$$

$$mn=-56$$

$$m=14 \quad n=-4$$

Hence

$$=7+10a-8a^2+14a-4a+7$$

$$=-4a(2a+1)+7(2a+1)$$

$$=(7-4a)(2a+1)$$

Substituting Back

$$=(7-4x+4y)(8x+8y+1)$$

$$=7+10(x+y)-8(x+y)^2=(7-4x-4y)(8x+8y+1)$$