

**IDENTITIES, FACTORIZATION (A)**Form 2 Regular Course  
Vol 2**Part 5 – Factorization (Grouping Terms)**

$$\begin{aligned} 2. \quad (b) \quad & 12ac + 6bd - 9ad - 8bc \\ & = 3a(4c - 3d) + 2b(3d - 4c) \\ & = (4c - 3d)(3a - 2b) \end{aligned}$$

$$\begin{aligned} (c) \quad & a^2 + 2bc - 2ab - ac \\ & = a^2 - 2ab - ac + 2bc \\ & = a(a - 2b) - c(a - 2b) \\ & = (a - 2b)(a - c) \end{aligned}$$

$$\begin{aligned} (d) \quad & 20ab + 9cd - 30bc - 6ad \\ & = 10b(2a - 3c) + 3d(3c - 2a) \\ & = (2a - 3c)(10b - 3d) \end{aligned}$$

$$\begin{aligned} (e) \quad & 4x^3 - 3y + 4x - 3x^2y \\ & = 4x(x^2 + 1) - 3y(1 + x^2) \\ & = (x^2 + 1)(4x - 3y) \end{aligned}$$

$$\begin{aligned} (f) \quad & ax + 6by + 3ay + 2bx \\ & = x(a + 2b) + 3y(a + 2b) \\ & = (a + 2b)(x + 3y) \end{aligned}$$

$$\begin{aligned} (g) \quad & 8y - xz + 4x - 2yz \\ & = 2y(4 - z) - x(z - 4) \\ & = (x + 2y)(4 - z) \end{aligned}$$

$$\begin{aligned} (h) \quad & bc + a^2bc + a + ab^2c^2 \\ & = bc + a + abc(a + bc) \\ & = (a + bc)(abc + 1) \end{aligned}$$

$$\begin{aligned} (i) \quad & 6ay + 2ax + 3a^2 + 4xy \\ & = 3a(2y + a) + 2x(a + 2y) \\ & = (a + 2y)(3a + 2x) \end{aligned}$$

$$\begin{aligned} \text{(j)} \quad & 5y - 2a^2 + 10a - ay \\ &= y(5 - a) - 2a(a - 5) \\ &= (5 - a)(y + 2a) \end{aligned}$$

$$\begin{aligned} \text{(k)} \quad & 6ax + 2x - 3x^2 - 4a \\ &= 2a(3x - 2) + x(2 - 3x) \\ &= (3x - 2)(2a - x) \end{aligned}$$

### Part 6 – Factorization (Hence Type)

$$1. \text{ (a)} \quad 5a^2 + 3a = a(5a + 3)$$

$$\begin{aligned} \text{(b)} \quad & 5a^2 + 8a + 3 \\ &= 5a^2 + 3a - 3a + 8a + 3 \\ &= a(5a + 3) + 5a + 3 \\ &= (5a + 3)(a + 1) \end{aligned}$$

$$2. \text{ (a)} \quad 6x^2 + 8x = 2x(3x + 4)$$

$$\begin{aligned} \text{(b)} \quad & 6x^2 + 17x + 12 \\ &= 6x^2 + 8x - 8x + 17x + 12 \\ &= 2x(3x + 4) + 3(3x + 4) \\ &= (3x + 4)(2x + 3) \end{aligned}$$

$$3. \text{ (a)} \quad 6a + 4 = 2(3a + 2)$$

$$\text{(b)} \quad 21a^2 + 14a = 7a(3a + 2)$$

$$\begin{aligned} \text{(c)} \quad & 21a^2b^2 + 8ab - 4 \\ &= 21a^2b^2 + 14ab - 14ab + 8ab - 4 \\ &= 7ab(3ab + 2) - 2(3ab + 2) \\ &= (3ab + 2)(7ab - 2) \end{aligned}$$

# FACTORIZATION (B), ALGEBRAIC FRACTION AND FORMULA

Form 2 Regular Course

Vol 3

## Part 1 - Factorization using identities

1. (c)  $(x+7)^2$

(d)  $(x-5)^2$

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

(f)  $(a-9b)^2$

(k)  $(5x+9y)(5x-9y)$

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

(m)  $(8x+11y)(8x-11y)$

(n)  $(15x+7y)(15x-7y)$

2. (b)  $(x-2y)^2 - 6(x-2y) + 9$

$$= (x-2y-3)^2$$

(c)  $4(m+1)^2 - 4(m+1) + 1$

$$= [2(m+1) - 1]^2$$

$$= (2m+1)^2$$

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

$$= (x-2y-x)^2$$

$$= 4y^2$$

(f)  $(x+5y)^2 - 25$

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



$$\begin{aligned}
 \text{(g)} \quad & 4(a-2b)^2 - 25a^2 \\
 &= [2(a-2b)+5a][2(a-2b)-5a] \\
 &= (2a-4b+5a)(2a-4b-5a) \\
 &= (7a-4b)(-3a-4b) \\
 &= (4b-7a)(3a+4b)
 \end{aligned}$$

$$\begin{aligned}
 \text{(h)} \quad & (x+3y)^2 - (2x-y)^2 \\
 &= [(x+3y)+(2x-y)][(x+3y)-(2x-y)] \\
 &= -(3x+2y)(x-4y)
 \end{aligned}$$

$$\begin{aligned}
 3. \text{ (e)} \quad & -9x^2 - 36x - 36 \\
 &= -9(x^2 + 4x + 4) \\
 &= -9(x+2)^2
 \end{aligned}$$

$$\begin{aligned}
 \text{(f)} \quad & -8a^2b - 24ab - 18b \\
 &= -2b(4a^2 + 12a + 9) \\
 &= -2b(2a+3)^2
 \end{aligned}$$

$$\begin{aligned}
 \text{(g)} \quad & -9x^2 + 6x - 1 \\
 &= -(9x^2 - 6x + 1) \\
 &= -(3x-1)^2
 \end{aligned}$$

$$\begin{aligned}
 \text{(l)} \quad & 20ax^2 - 5ay^2 \\
 &= 5a(4x^2 - y^2) \\
 &= 5a(2x+y)(2x-y)
 \end{aligned}$$

$$\begin{aligned}
 \text{(m)} \quad & 128cx^2 - 32cy^2 \\
 &= 32c(4x^2 - y^2) \\
 &= 32c(2x+y)(2x-y)
 \end{aligned}$$

$$\begin{aligned}
 \text{(n)} \quad & -3a^2b + 75b \\
 &= -3b(a^2 - 25) \\
 &= -3b(a+5)(a-5)
 \end{aligned}$$