

Expansion and factorization of expressions

1

(1) Arrange the following expressions in descending order for the letters in [] and answer the order and constant terms when focusing on the letters in [].

① $2a^2+3+a^4+2a^4+3a^2+a^6$ [a]

② $x^2+y^2+z^2+xy+yz+zx$ [z]

(2) If $A=x^2+2ax+2$ and $B=a^2-3ax+1$, calculate the following.

① $3A+2B$

② $A-\{2B+3(A-2B)\}$

2

(1) Calculate the following expressions.

① $(-2a^2b)^3$

② $x^2y^3 \times (-xy^2z)^2$

(2) Expand the following expressions.

① $(x^2 - x - 1)(2x + 1)$

② $(a + b + 1)(2a - 3b - 1)$

3 Expand the following expressions.

(1) $(a-2b)^2$

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

(3) $(a-5)(a+7)$

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

4 Expand the following expressions.

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

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

5 Factorize the following expressions.

(1) $3ax^2 - 6a^2b$

(2) $16a^2 + 8a + 1$

(3) $x^2 - x + \frac{1}{4}$

(4) $64x^2 - 25y^2$

(5) $a^2 + 3ab - 10b^2$

(6) $3x^2 - 12$

6 Factorize the following expressions.

(1) $3x^2 + 5x - 2$

(2) $4a^2 + 8a + 3$

(3) $6x^2 + xy - 2y^2$

(4) $8a^2 - 14ab - 15b^2$

7 Factorize the following expressions.

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

(2) $4a^2-9b^2+6bc-c^2$

8 Factorize the following expressions.

(1) $x^2 - 2xy + 3x - 4y + 2$

(2) $6ab + 4a - 3b - 2$

(3) $2x^2 + 3xy - 2y^2 + x + 2y$

(4) $2x^2 + 7xy + 3y^2 - 5x - 10y + 3$

Study 1

(1) Expand the following expressions.

① $(3x-1)^3$

② $(4a+3b)(16a^2-12ab+9b^2)$

(2) Factorize the following equation.

① $1-a^3$

② $1000x^3+y^3$

Study 2

Factorize the following equation.

(1) $x^4 - 1$

(2) $x^4 - 2x^2 - 8$

(3) $x^4 + 4$

(4) $x^4 - 3x^2 + 1$