

因数分解

<公式>

$$\textcircled{1} (a+b)^2 = a^2 + 2ab + b^2$$

$$\textcircled{2} (a-b)^2 = a^2 - 2ab + b^2$$

$$\textcircled{3} (a+b)(a-b) = a^2 - b^2$$

$$\textcircled{4} (x+a)(x+b) = x^2 + (a+b)x + ab$$

④ ← 太字に掛ける

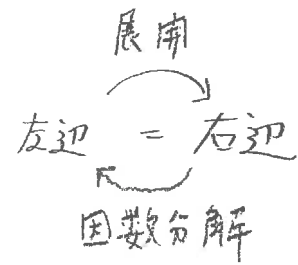
$$\textcircled{5} (a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$\textcircled{6} (a-b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$$

$$\textcircled{7} (a+b)(a^2 - ab + b^2) = a^3 + b^3$$

$$\textcircled{8} (a-b)(a^2 + ab + b^2) = a^3 - b^3$$

$$\textcircled{9} (a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$$

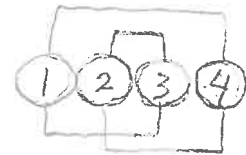


<解き方>

STEP. 1 共通因数を見つける

STEP. 2 公式を考える

STEP. 3 以下の4>のパターンを考える



《パターン1》 $\bigcirc \circ$ を A とおく

$$(1) (x^2 + 3x)^2 - 2(x^2 + 3x) - 8$$

$$x^2 + 3x = A$$

$$= A^2 - 2A - 8$$

$$= (A - 4)(A + 2)$$

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

$$= (x + 4)(x - 1)(x + 1)(x + 2)$$

$$(2) (x+1)(x+2)(x+3)(x+4) - 24$$

$$= (x^2 + 5x + 4)(x^2 + 5x + 6) - 24$$

$$x^2 + 5x = A$$

$$= (A + 4)(A + 6) - 24$$

$$= A^2 + 10A + 24 - 24$$

$$= A(A + 10)$$

$$= (x^2 + 5x)(x^2 + 5x + 10)$$

$$= x(x + 5)(x^2 + 5x + 10)$$

《18°7-2》 次数の小さい文字に注目 ⇒ ()文字 + ()

$$(1) 9b^2 + 3ab - 2a - 4$$

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

$$= \underline{(3b - 2)a + (3b + 2)(3b - 2)}$$

$$= (3b - 2) \{ a + (3b + 2) \}$$

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

$$(2) x^3 - x^2y - xz^2 + yz^2$$

$$= (-x^2 + z^2)y + (x^3 - xz^2)$$

$$= -\underline{(x^2 - z^2)y} + x \underline{(x^2 - z^2)}$$

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

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

《18°7-3》 1つの文字について整理

$$(1) \underline{a^2b} + \underline{ab^2} + b^2c + bc^2 + \underline{c^2a} + \underline{ca^2} + \underline{2abc}$$

$$= (b + c)a^2 + \underline{(b^2 + 2bc + c^2)a} + \underline{(b^2c + bc^2)}$$

$$= (b + c)a^2 + (b + c)^2a + bc(b + c)$$

$$= (b + c) \{ \underline{a^2 + (b + c)a + bc} \} \leftarrow \text{公式④} \quad a \rightarrow x$$

$$= (b + c)(a + b)(a + c)$$

$$(2) \underline{a^2(b - c)} + \underline{b^2(c - a)} + \underline{c^2(a - b)}$$

$$= a^2(b - c) + b^2c - \underline{b^2a} + \underline{c^2a} - c^2b$$

$$= (b - c)a^2 + \underline{(-b^2 + c^2)a} + \underline{(b^2c - cb^2)}$$

$$= (b - c)a^2 - \underline{(b^2 - c^2)a} + bc(b - c)$$

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

$$= (b - c) \{ \underline{a^2 - (b + c)a + bc} \} \leftarrow \text{公式④}$$

$$= (b - c)(a - b)(a - c)$$

《107-4》「たすき掛け」2回

$$(1) x^2 - xy - 2y^2 - x - 7y - 6$$

$$= x^2 + (-y-1)x - (2y^2 + 7y + 6)$$

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

$$= \{x + (y+2)\} \{x - (2y+3)\}$$

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

$$\begin{array}{r} 1 \quad +2 \quad - \quad +4 \\ 2 \quad +3 \quad - \quad +3 \\ \hline 2 \quad +6 \quad - \quad +7 \end{array}$$

$$\begin{array}{r} 1 \quad (y+2) \quad - \quad y+2 \\ 1 \quad -(2y+3) \quad - \quad -2y-3 \\ \hline 1 \quad \ominus(y+2)(2y+3) \quad - \quad -y-1 \end{array}$$

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

$$= 3x^2 + (7y-5)x + (2y^2 - 5y + 2)$$

$$= 3x^2 + (7y-5)x + (y-2)(2y-1)$$

$$= \{x + (2y-1)\} \{3x + (y-2)\}$$

$$= (x + 2y - 1)(3x + y - 2)$$

$$\begin{array}{r} 1 \quad -2 \quad - \quad -4 \\ 2 \quad -1 \quad - \quad -1 \\ \hline 2 \quad +2 \quad - \quad -5 \end{array}$$

$$\begin{array}{r} 1 \quad +(2y-1) \quad - \quad 6y-3 \\ 3 \quad +(y-2) \quad - \quad y-2 \\ \hline 3 \quad (y-2)(2y-1) \quad 7y-5 \end{array}$$