



## ①式の展開

## P2

- 1** (1)  $10a^2 - 6ab$  (2)  $-12xy + 21xz$   
 (3)  $-a^2b + ab^2$  (4)  $4x^2y + 32xy^2$   
 (5)  $15x^2 + 21xy - 18xz$  (6)  $-14a^2 + 7ab + 21ac$   
 (7)  $15ax + 6ay$  (8)  $-\frac{15}{2}ax + 4bx$
- 2** (1)  $12xy - 30y^2$  (2)  $-8ab + 18b^2$   
 (3)  $4p^2q^2 - 3pq^3$  (4)  $-\frac{1}{6}x^3y + \frac{10}{27}xy^2$   
 (5)  $8x^2 + 6xy - 10x$  (6)  $-x^2y + 2xy^2 - 3y$
- 3** (1)  $3b - 2$  (2)  $-2x + 3y$  (3)  $-6x - 7y$   
 (4)  $2a - 3$  (5)  $2a^2 + 6a - 3$   
 (6)  $-6p^2 + 11pq - 9q^2$
- 4** (1)  $6x - 12y$  (2)  $-12m + 20$   
 (3)  $10ab - 45bc + 20c^2$  (4)  $\frac{3}{2} + \frac{9x}{7y} - \frac{10}{7y}$

## 解説

- 1** (8)  $-18x\left(\frac{5}{12}a - \frac{2}{9}b\right)$   
 $= -18x \times \frac{5}{12}a - 18x \times \left(-\frac{2}{9}b\right)$   
 $= -\frac{15}{2}ax + 4bx$
- 2** (5)  $\left(-\frac{1}{3}x - \frac{1}{4}y + \frac{5}{12}\right) \times (-24x)$   
 $= -\frac{1}{3}x \times (-24x) - \frac{1}{4}y \times (-24x)$   
 $+ \frac{5}{12} \times (-24x) = 8x^2 + 6xy - 10x$
- 3** (6)  $(18p^3q - 33p^2q^2 + 27pq^3) \div (-3pq)$   
 $= -\frac{18p^3q}{3pq} + \frac{33p^2q^2}{3pq} - \frac{27pq^3}{3pq}$   
 $= -6p^2 + 11pq - 9q^2$
- 4** (3)  $(-8abc + 36bc^2 - 16c^3) \div \left(-\frac{4}{5}c\right)$   
 $= -8abc \times \left(-\frac{5}{4c}\right) + 36bc^2 \times \left(-\frac{5}{4c}\right)$   
 $- 16c^3 \times \left(-\frac{5}{4c}\right) = 10ab - 45bc + 20c^2$
- (4)  $\left(\frac{7}{8}xy^2 + \frac{3}{4}x^2y - \frac{5}{6}xy\right) \div \frac{7}{12}xy^2$   
 $= \frac{7}{8}xy^2 \times \frac{12}{7xy^2} + \frac{3}{4}x^2y \times \frac{12}{7xy^2}$   
 $- \frac{5}{6}xy \times \frac{12}{7xy^2} = \frac{3}{2} + \frac{9x}{7y} - \frac{10}{7y}$

## P3

- 5** (1)  $7a^2 + 6a$  (2)  $3m^2 - 7m$  (3)  $6xy^2$   
 (4)  $6p^2q + 4pq^2$  (5)  $7a^3 + a^2 + 4a$   
 (6)  $7x^2 - xy - 2xz$  (7)  $-x^2 - xy$   
 (8)  $a^2b + \frac{5}{6}ab^2$  (9)  $-x^2 + 8x^2y - 15xy$   
 (10)  $-a^3 + a^2b - 8a^2$
- 6** (1)  $ax + ay + bx + by$  (2)  $ac - ad + bc - bd$   
 (3)  $ax - ay - bx + by$  (4)  $ab + 4a + 2b + 8$   
 (5)  $xy + 3x - y - 3$  (6)  $ax - 5a - 4x + 20$
- 7** (1)  $a^2 + 7a + 10$  (2)  $x^2 + 5x + 4$  (3)  $a^2 + 4a - 12$   
 (4)  $3a^2 + 10a + 3$  (5)  $6x^2 - 13x - 8$   
 (6)  $20y^2 - 23y + 6$  (7)  $a^2 + 3ab + 2b^2$   
 (8)  $x^2 - 6xy - 16y^2$  (9)  $6x^2 - 7xy - 20y^2$
- 8** (1)  $a^2 + ac - b^2 + bc$  (2)  $a^3 + 3a^2 + a - 2$   
 (3)  $a^2 + 7a + 2ab + 6b + 12$  (4)  $a^3 - b^3$   
 (5)  $ax + bx + cx + dx + ay + by + cy + dy$   
 (6)  $2x^2 - 13x - 6xy + 15y + 2xz - 5z + 20$   
 (7)  $ax - ay + az + bx - by + bz - cx + cy - cz$   
 (8)  $2a^2 + 7ab + a - 4b^2 + 31b - 21$

## 解説

- 5** (9)  $\frac{3}{4}x(4x + 8xy - 12y) - \frac{2}{3}x(6x - 3xy + 9y)$   
 $= 3x^2 + 6x^2y - 9xy - 4x^2 + 2x^2y - 6xy$   
 $= -x^2 + 8x^2y - 15xy$
- 6** (4)  $(a+2)(b+4)$   
 $= a(b+4) + 2(b+4) = ab + 4a + 2b + 8$
- 7** (6)  $(4y-3)(5y-2)$   
 $= 4y(5y-2) - 3(5y-2)$   
 $= 20y^2 - 8y - 15y + 6 = 20y^2 - 23y + 6$
- 8** (4)  $(a^2 + ab + b^2)(a - b)$   
 $= a^2(a - b) + ab(a - b) + b^2(a - b)$   
 $= a^3 - a^2b + a^2b - ab^2 + ab^2 - b^3 = a^3 - b^3$
- (8)  $(2a - b + 7)(a + 4b - 3)$   
 $= 2a(a + 4b - 3) - b(a + 4b - 3)$   
 $+ 7(a + 4b - 3)$   
 $= 2a^2 + 8ab - 6a - ab - 4b^2 + 3b + 7a + 28b - 21$   
 $= 2a^2 + 7ab + a - 4b^2 + 31b - 21$

## P4

- 9** (1)  $x^2 + 7x + 12$  (2)  $x^2 + 10x + 16$   
 (3)  $a^2 + 8a - 9$  (4)  $x^2 + 3x - 18$   
 (5)  $x^2 - 5x - 6$  (6)  $y^2 - 5y - 14$  (7)  $x^2 + 2x - 24$   
 (8)  $x^2 - 15x + 56$  (9)  $b^2 - 14b + 45$
- 10** (1)  $a^2 + 5ab + 6b^2$  (2)  $a^2 + 4ab - 5b^2$   
 (3)  $x^2 - 7xy + 12y^2$  (4)  $x^2 - 2xy - 24y^2$   
 (5)  $p^2 - 12pq + 35q^2$  (6)  $s^2 + 11st + 30t^2$

- 11** (1)  $4a^2+16a+15$  (2)  $16x^2-24x+5$   
 (3)  $16x^2-32xy+15y^2$
- 12** (1)  $x^2+6x+9$  (2)  $a^2+14a+49$  (3)  $x^2+8x+16$   
 (4)  $a^2+2a+1$  (5)  $x^2+16x+64$   
 (6)  $x^2-10x+25$  (7)  $a^2-4a+4$   
 (8)  $x^2-18x+81$  (9)  $a^2-12a+36$
- 13** (1)  $x^2+10xy+25y^2$  (2)  $a^2+6ab+9b^2$   
 (3)  $x^2+14xy+49y^2$  (4)  $a^2-2ab+b^2$   
 (5)  $x^2-12xy+36y^2$  (6)  $a^2-20ab+100b^2$
- 14** (1)  $4x^2+20x+25$  (2)  $9a^2+6a+1$   
 (3)  $49m^2-56m+16$  (4)  $25a^2+60ab+36b^2$   
 (5)  $64x^2-80xy+25y^2$  (6)  $81s^2-36st+4t^2$   
 (7)  $a^2+a+\frac{1}{4}$  (8)  $16a^2-3a+\frac{9}{64}$   
 (9)  $\frac{25}{36}x^2-xy+\frac{9}{25}y^2$

**解説**

- 9** 2数の和 $\Rightarrow x$ の係数, 積 $\Rightarrow$ 定数項
- 10** (3)  $(x-4y)(x-3y)$   
 $=x^2+\{(-4y)+(-3y)\}x+(-4y)\times(-3y)$   
 $=x^2-7xy+12y^2$
- 11** (1)  $(2a+3)(2a+5)$   
 $= (2a)^2+(3+5)\times 2a+3\times 5$   
 $= 4a^2+16a+15$   
 (3)  $(4x-3y)(4x-5y)$   
 $= (4x)^2+\{(-3y)+(-5y)\}\times 4x+(-3y)\times(-5y)$   
 $= 16x^2-32xy+15y^2$
- 12** 2倍 $\Rightarrow x$ の係数, 2乗 $\Rightarrow$ 定数項
- 13** (2)  $(a+3b)^2$   
 $= a^2+2\times 3b\times a+(3b)^2=a^2+6ab+9b^2$
- 14** (2)  $(3a+1)^2$   
 $= (3a)^2+2\times 1\times 3a+1^2=9a^2+6a+1$   
 (5)  $(8x-5y)^2$   
 $= (8x)^2-2\times 5y\times 8x+(5y)^2$   
 $= 64x^2-80xy+25y^2$   
 (9)  $\left(\frac{5}{6}x-\frac{3}{5}y\right)^2$   
 $= \left(\frac{5}{6}x\right)^2-2\times \frac{3}{5}y\times \frac{5}{6}x+\left(\frac{3}{5}y\right)^2$   
 $= \frac{25}{36}x^2-xy+\frac{9}{25}y^2$

**P5**

- 15** (1)  $x^2-4$  (2)  $x^2-25$  (3)  $x^2-64$  (4)  $a^2-16$   
 (5)  $a^2-1$  (6)  $y^2-81$  (7)  $x^2-49$  (8)  $b^2-100$   
 (9)  $a^2-196$  (10)  $t^2-36$  (11)  $p^2-144$   
 (12)  $m^2-121$
- 16** (1)  $36x^2-25$  (2)  $9a^2-49$  (3)  $16m^2-9$   
 (4)  $100a^2-1$  (5)  $81x^2-4$  (6)  $25p^2-169$

- 17** (1)  $x^2-16y^2$  (2)  $m^2-81n^2$  (3)  $36a^2-b^2$   
 (4)  $x^2-\frac{1}{9}y^2$  (5)  $\frac{1}{4}a^2-\frac{4}{9}b^2$  (6)  $\frac{25}{49}s^2-0.04t^2$
- 18** (1)  $4a^2+9a-4$  (2)  $2x^2+3x-18$  (3)  $8x+51$   
 (4)  $2a^2+4a+19$  (5)  $-18a+81$   
 (6)  $2x^2-10x-39$  (7)  $4x-20$  (8)  $2a^2+14a$
- 19** (1)  $2x^2+5xy+67y^2$  (2)  $-5ab$   
 (3)  $7x^2+8xy-3y^2$  (4)  $a^2+24ab-82b^2$   
 (5)  $125m^2+20mn+20n^2$  (6)  $28x^2-142y^2$

**解説**

- 15** (10)  $(t-6)(t+6)=(t+6)(t-6)=t^2-6^2=t^2-36$
- 16** (1)  $(6x+5)(6x-5)=(6x)^2-5^2=36x^2-25$
- 17** (2)  $(m-9n)(m+9n)$   
 $= (m+9n)(m-9n)=m^2-(9n)^2=m^2-81n^2$   
 (5)  $\left(\frac{1}{2}a-\frac{2}{3}b\right)\left(\frac{1}{2}a+\frac{2}{3}b\right)$   
 $= \left(\frac{1}{2}a+\frac{2}{3}b\right)\left(\frac{1}{2}a-\frac{2}{3}b\right)$   
 $= \left(\frac{1}{2}a\right)^2-\left(\frac{2}{3}b\right)^2=\frac{1}{4}a^2-\frac{4}{9}b^2$
- 18** (5)  $(a-7)^2-(a-4)(a+8)$   
 $= (a^2-14a+49)-(a^2+4a-32)$   
 $= a^2-14a+49-a^2-4a+32=-18a+81$   
 (7)  $(x+4)(x-4)-(x-2)^2$   
 $= (x^2-16)-(x^2-4x+4)$   
 $= x^2-16-x^2+4x-4=4x-20$
- 19** (2)  $(a-6b)(a+2b)-(a+4b)(a-3b)$   
 $= (a^2-4ab-12b^2)-(a^2+ab-12b^2)$   
 $= a^2-4ab-12b^2-a^2-ab+12b^2=-5ab$   
 (5)  $2(5m-2n)^2+3(5m+2n)^2$   
 $= 2(25m^2-20mn+4n^2)+3(25m^2+20mn+4n^2)$   
 $= 50m^2-40mn+8n^2+75m^2+60mn+12n^2$   
 $= 125m^2+20mn+20n^2$

**P6**

- 20** (1)  $a^2+2ab+b^2+a+b-12$   
 (2)  $x^2+4xy+4y^2-8x-16y+12$   
 (3)  $a^2-2ab+b^2+10a-10b+25$   
 (4)  $x^2+6xy+9y^2-14x-42y+49$   
 (5)  $x^2+2xy+y^2-16$  (6)  $a^2-10ab+25b^2-64$
- 21** (1)  $a^2+12a+36-b^2$  (2)  $a^2+10a+25-16b^2$   
 (3)  $4x^2-12x+9-y^2$  (4)  $16a^2-8ac+c^2-9b^2$   
 (5)  $x^2-y^2+2y-1$  (6)  $9x^2-49y^2+56yz-16z^2$
- 22** (1)  $a^4-16$  (2)  $x^4-y^4$  (3)  $1-x^8$  (4)  $16a^4-81$
- 23** (1)  $a^4+10a^3+35a^2+50a+24$   
 (2)  $x^4-2x^3-31x^2+32x+60$   
 (3)  $x^4+8x^3-26x^2-168x-135$   
 (4)  $a^4-10a^3+25a^2-36$

解説

20 (3)  $(a-b+5)^2$   
 $= \{(a-b)+5\}^2$   
 $= (a-b)^2 + 2 \times 5 \times (a-b) + 5^2$   
 $= a^2 - 2ab + b^2 + 10a - 10b + 25$   
 (6)  $(a-5b-8)(a-5b+8)$   
 $= \{(a-5b)+8\} \{(a-5b)-8\}$   
 $= (a-5b)^2 - 8^2 = a^2 - 10ab + 25b^2 - 64$

21 (1)  $(a+b+6)(a-b+6)$   
 $= \{(a+6)+b\} \{(a+6)-b\}$   
 $= (a+6)^2 - b^2 = a^2 + 12a + 36 - b^2$

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

22 (3)  $(1-x)(1+x)(1+x^2)(1+x^4)$   
 $= (1-x^2)(1+x^2)(1+x^4)$   
 $= \{1-(x^2)^2\}(1+x^4) = (1-x^4)(1+x^4)$   
 $= 1^2 - (x^4)^2 = 1 - x^8$

23 (3)  $(x-5)(x+1)(x+3)(x+9)$   
 $= (x-5)(x+9)(x+1)(x+3)$   
 $= (x^2+4x-45)(x^2+4x+3)$   
 $x^2+4x=M$  とおくと,  
 $(M-45)(M+3) = M^2 - 42M - 135$   
 $= (x^2+4x)^2 - 42(x^2+4x) - 135$   
 $= x^4 + 8x^3 + 16x^2 - 42x^2 - 168x - 135$   
 $= x^4 + 8x^3 - 26x^2 - 168x - 135$

P7

24 (1) 2 (2) -16 (3) -17 (4) 1 (5) -11

問題1 (1)  $6x^2+17x+12$  (2)  $4x^2+13x+10$   
 (3)  $4x^2-5x-6$  (4)  $6x^2+13x-5$   
 (5)  $18a^2+3a-10$  (6)  $12x^2-25x-7$   
 (7)  $14x^2-57x-27$  (8)  $10a^2+19a-15$   
 (9)  $6x^2-11x+4$  (10)  $5a^2-33a+18$

問題2 (1)  $3a^2+7ab+2b^2$  (2)  $8x^2+26xy+15y^2$   
 (3)  $2a^2-5ab-12b^2$  (4)  $6x^2+xy-15y^2$   
 (5)  $6x^2+7xy-49y^2$  (6)  $12a^2+4ab-5b^2$   
 (7)  $40x^2-63xy+18y^2$  (8)  $12a^2-56ab+9b^2$   
 (9)  $4a^2b^2+23abc-6c^2$   
 (10)  $63x^2-100xyz+32y^2z^2$

解説

24 それぞれ係数のみを計算すると、次のようになる。  
 (1)  $1 \times (-3) + 5 \times 1 = 2$   
 (2)  $1 \times (-2) + 2 \times (-7) = -16$   
 (3)  $1 \times 1 + 5 \times (-4) + 1 \times 2 = -17$   
 (4)  $1 \times (-5) + 2 \times 3 = 1$   
 (5)  $3 \times (-1) + (-5) \times 1 + (-3) \times 1 = -11$

問題1 (6)  $(3x-7)(4x+1)$   
 $= (3 \times 4)x^2 + (3 \times 1 - 7 \times 4)x + (-7) \times 1$   
 $= 12x^2 - 25x - 7$   
 (9)  $(3x-4)(2x-1)$   
 $= (3 \times 2)x^2 + \{3 \times (-1) - 4 \times 2\}x$   
 $+ (-4) \times (-1)$   
 $= 6x^2 - 11x + 4$

問題2 (2)  $(4x+3y)(2x+5y)$   
 $= (4 \times 2)x^2 + (4 \times 5y + 3y \times 2)x + 3y \times 5y$   
 $= 8x^2 + 26xy + 15y^2$   
 (9)  $(ab+6c)(4ab-c)$   
 $= (1 \times 4)(ab)^2 + \{1 \times (-c) + 6c \times 4\}ab$   
 $+ 6c \times (-c)$   
 $= 4a^2b^2 + 23abc - 6c^2$

P8

[チェック問題]

1 (1)  $21a^2b-9abc$  (2)  $8x^2y^2-10xy^3$   
 (3)  $-3ab+4b^2$  (4)  $12xy+16$   
 (5)  $6x^3-28x^2y-8xy^2$  (6)  $-4ab^2+3ab-18b^2$   
 2 (1)  $x^2+9x+18$  (2)  $4x^2-9$   
 (3)  $a^2+16ab+64b^2$  (4)  $3x^2-13x-30$   
 (5)  $9x^2+9x-4$  (6)  $x^2-25y^2$   
 (7)  $m^2-26m+169$  (8)  $x^2-7x-18$   
 (9)  $6a^2-11ab-10b^2$  (10)  $16s^2-32st+15t^2$   
 (11)  $49p^2-16q^2$  (12)  $25a^2-90ab+81b^2$   
 (13)  $4a^2+20ab+21b^2$  (14)  $25p^2-4q^2r^2$   
 (15)  $49x^2-140x+100$  (16)  $7x^2-50xy+7y^2$   
 (17)  $a^2+30a+225$  (18)  $9x^2y^2-15xy-14$   
 3 (1)  $2x^2+127$  (2)  $2a^2+200$  (3)  $-3ab+8b^2$   
 (4)  $2x^2+2xy-15y^2$  (5)  $5y^2-12y+5$   
 (6)  $a^2+a+33$  (7)  $t^2-12t-82$  (8)  $x^2-48xy$   
 4 (1)  $x^2+4xy+4y^2+2x+4y-15$   
 (2)  $a^2-12ab+36b^2+8ac-48bc+16c^2$   
 (3)  $a^2-25b^2+30b-9$  (4)  $4x^2-4x+1-y^2$   
 (5)  $x^2+12x+36+3xy+18y+2y^2$   
 (6)  $a^4+a^2b^2+b^4$   
 5 (1)  $a^4-81$  (2)  $x^4-\frac{1}{16}$   
 (3)  $x^4-4x^3-34x^2+76x+105$   
 (4)  $a^4-18a^3+119a^2-342a+360$   
 (5)  $x^4-2x^3-13x^2+14x+24$   
 (6)  $a^4+4a^3-3a^2-14a-8$   
 6 (1) 27 (2) 3