

☆式の計算⑥～展開の公式～

STEP-P23-13

次の式を展開しなさい。

(1) $(x+9)(x+5)$

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

(3) $(x-6)(x+2)$

(4) $(y+15)(y-8)$

(5) $(x-9)(x-3)$

(6) $\left(x-\frac{2}{3}\right)\left(x-\frac{4}{3}\right)$

STEP-P23-14

次の式を展開しなさい。

(1) $(2x+3)(2x+1)$

(2) $(4a+3)(4a-7)$

(3) $(8y-1)(8y-5)$

(4) $(3x-7)(3x-2)$

(5) $(-6a+1)(-6a+5)$

(6) $\left(\frac{1}{2}x+3\right)\left(\frac{1}{2}x-1\right)$

名前()

STEP-P23-15

次の式を展開しなさい。

(1) $(x+6)^2$ (2) $(a+10)^2$

(3) $(x-4)^2$ (4) $\left(a-\frac{3}{2}\right)^2$

STEP-P23-16

次の式を展開しなさい。

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

(2) $(4a+7)^2$

(3) $(-5p+8)^2$

(4) $(2x+3y)^2$

(5) $(7x-2y)^2$

(6) $(-4x-5y)^2$

(7) $\left(x+\frac{1}{2}y\right)^2$

(8) $\left(3a-\frac{5}{2}b\right)^2$

STEP-P24-17

次の式を展開しなさい。

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

(2) $(a+9)(a-9)$

(3) $(x-6)(x+6)$

(4) $(x+12)(x-12)$

(5) $(a-15)(a+15)$

(6) $(a+10)(-10+a)$

(7) $(7-m)(m+7)$

(8) $\left(x+\frac{2}{3}\right)\left(x-\frac{2}{3}\right)$

(9) $\left(-\frac{1}{4}+x\right)\left(\frac{1}{4}+x\right)$

STEP-P24-18

次の式を展開しなさい。

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

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

(3) $(4a-9b)(4a+9b)$

(4) $(2x+7y)(2x-7y)$

(5) $(3m-8n)(3m+8n)$

(6) $(5p+6q)(5p-6q)$

(7) $\left(\frac{1}{3}x+\frac{3}{4}y\right)\left(\frac{1}{3}x-\frac{3}{4}y\right)$

(8) $\left(\frac{1}{4}a-\frac{1}{5}b\right)\left(\frac{1}{4}a+\frac{1}{5}b\right)$

(9) $\left(\frac{1}{7}b+a\right)\left(a-\frac{1}{7}b\right)$

STEP-P25-22

次の計算をなさい。

(1) $(x+6)^2 - (x+12)(x+3)$

(4) $(2b-a)^2 - (a+5b)(a-b)$

(2) $(x-3)(x+15) - (x-6)^2$

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

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

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

STEP-P 2 6 - 2 3

次の計算をなさい。

$$(1) \frac{(x-2)(x-3)}{4} - \frac{(x-2)(x-3)+4}{5}$$

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

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

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

$$(5) \frac{(x-6y)(x+2y)}{2} - \frac{(x-3y)^2}{3}$$

$$(6) \frac{(x-2y)^2}{3} - \frac{x(2x-3y)}{4} + \frac{(7x-4y)y}{12}$$

☆式の計算⑥～展開の公式～解答

解答 (1) $x^2 + 14x + 45$ (2) $a^2 + 11a + 24$ (3) $x^2 - 4x - 12$

(4) $y^2 + 7y - 120$ (5) $x^2 - 12x + 27$ (6) $x^2 - 2x + \frac{8}{9}$

解答 (1) $4x^2 + 8x + 3$ (2) $16a^2 - 16a - 21$ (3) $64y^2 - 48y + 5$

(4) $9x^2 - 27x + 14$ (5) $36a^2 - 36a + 5$ (6) $\frac{1}{4}x^2 + x - 3$

解答 (1) $x^2 + 12x + 36$ (2) $a^2 + 20a + 100$ (3) $x^2 - 8x + 16$

(4) $a^2 - 3a + \frac{9}{4}$

解答 (1) $64x^2 - 16x + 1$ (2) $16a^2 + 56a + 49$ (3) $25p^2 - 80p + 64$

(4) $4x^2 + 12xy + 9y^2$ (5) $49x^2 - 28xy + 4y^2$ (6) $16x^2 + 40xy + 25y^2$

(7) $x^2 + xy + \frac{1}{4}y^2$ (8) $9a^2 - 15ab + \frac{25}{4}b^2$

解答 (1) $x^2 - 4$ (2) $a^2 - 81$ (3) $x^2 - 36$ (4) $x^2 - 144$ (5) $a^2 - 225$

(6) $a^2 - 100$ (7) $-m^2 + 49$ (8) $x^2 - \frac{4}{9}$ (9) $x^2 - \frac{1}{16}$

解答 (1) $9x^2 - y^2$ (2) $25x^2 - 9y^2$ (3) $16a^2 - 81b^2$ (4) $4x^2 - 49y^2$

(5) $9m^2 - 64n^2$ (6) $25p^2 - 36q^2$ (7) $\frac{1}{9}x^2 - \frac{9}{16}y^2$ (8) $\frac{1}{16}a^2 - \frac{1}{25}b^2$

(9) $a^2 - \frac{1}{49}b^2$

$$\begin{aligned}
 (1) \quad (x+6)^2 - (x+12)(x+3) &= (x^2 + 12x + 36) - (x^2 + 15x + 36) \\
 &= x^2 + 12x + 36 - x^2 - 15x - 36 \\
 &= -3x
 \end{aligned}$$

$$\begin{aligned}
 (2) \quad (x-3)(x+15) - (x-6)^2 &= (x^2 + 12x - 45) - (x^2 - 12x + 36) \\
 &= x^2 + 12x - 45 - x^2 + 12x - 36 \\
 &= 24x - 81
 \end{aligned}$$

$$\begin{aligned}
 (3) \quad (2x+3)^2 - (2x+5)(2x-5) &= (4x^2 + 12x + 9) - (4x^2 - 25) \\
 &= 4x^2 + 12x + 9 - 4x^2 + 25 \\
 &= 12x + 34
 \end{aligned}$$

$$\begin{aligned}
 (4) \quad (2b-a)^2 - (a+5b)(a-b) &= (4b^2 - 4ab + a^2) - (a^2 + 4ab - 5b^2) \\
 &= 4b^2 - 4ab + a^2 - a^2 - 4ab + 5b^2 \\
 &= 9b^2 - 8ab
 \end{aligned}$$

$$\begin{aligned}
 (5) \quad (3x-2y)(2y+3x) + (5x-2y)^2 &= (3x-2y)(3x+2y) + (5x-2y)^2 \\
 &= (9x^2 - 4y^2) + (25x^2 - 20xy + 4y^2) \\
 &= 9x^2 - 4y^2 + 25x^2 - 20xy + 4y^2 \\
 &= 34x^2 - 20xy
 \end{aligned}$$

$$\begin{aligned}
 (6) \quad (2a-6b)^2 + (4a+3b)^2 &= (4a^2 - 24ab + 36b^2) + (16a^2 + 24ab + 9b^2) \\
 &= 4a^2 - 24ab + 36b^2 + 16a^2 + 24ab + 9b^2 \\
 &= 20a^2 + 45b^2
 \end{aligned}$$

解答 (1) $\frac{x^2 - 5x - 10}{20}$ (2) $\frac{-3x^2 + 19x - 10}{12}$ (3) $\frac{9a^2 - 7a}{4}$

(4) $\frac{3x+7}{4}$ (5) $\frac{x^2 - 54y^2}{6}$ (6) $\frac{-x^2 + 6y^2}{6}$

$$\begin{aligned}
 (1) \quad \frac{(x-2)(x-3)}{4} - \frac{(x-2)(x-3)+4}{5} &= \frac{5(x-2)(x-3) - 4(x-2)(x-3) - 4 \times 4}{20} \\
 &= \frac{(x-2)(x-3) - 16}{20} \\
 &= \frac{(x^2 - 5x + 6) - 16}{20} \\
 &= \frac{x^2 - 5x - 10}{20}
 \end{aligned}$$

$$(2) \quad \frac{(1-x)(3x-1)}{3} - \frac{(-3x+2)(x+1)}{4} = \frac{4(1-x)(3x-1) - 3(-3x+2)(x+1)}{12}$$

$$\begin{aligned}
&= \frac{4(-3x^2 + 4x - 1) - 3(-3x^2 - x + 2)}{12} \\
&= \frac{-12x^2 + 16x - 4 + 9x^2 + 3x - 6}{12} \\
&= \frac{-3x^2 + 19x - 10}{12}
\end{aligned}$$

$$\begin{aligned}
(3) \quad \frac{(a-2)^2}{2} - \frac{a(a-1)}{4} + 2(a+1)(a-1) &= \frac{2(a-2)^2 - a(a-1) + 8(a+1)(a-1)}{4} \\
&= \frac{2(a^2 - 4a + 4) - a^2 + a + 8(a^2 - 1)}{4} \\
&= \frac{2a^2 - 8a + 8 - a^2 + a + 8a^2 - 8}{4} \\
&= \frac{9a^2 - 7a}{4}
\end{aligned}$$

$$\begin{aligned}
(4) \quad \left(\frac{x-1}{2}\right)^2 - \frac{(x-2)(x+3)}{4} + \frac{3}{2}x &= \frac{(x-1)^2}{4} - \frac{(x-2)(x+3)}{4} + \frac{3}{2}x \\
&= \frac{(x-1)^2 - (x-2)(x+3) + 3x \times 2}{4} \\
&= \frac{x^2 - 2x + 1 - x^2 - x + 6 + 6x}{4} \\
&= \frac{3x + 7}{4}
\end{aligned}$$

$$\begin{aligned}
(5) \quad \frac{(x-6y)(x+2y)}{2} - \frac{(x-3y)^2}{3} &= \frac{3(x-6y)(x+2y) - 2(x-3y)^2}{6} \\
&= \frac{3(x^2 - 4xy - 12y^2) - 2(x^2 - 6xy + 9y^2)}{6} \\
&= \frac{3x^2 - 12xy - 36y^2 - 2x^2 + 12xy - 18y^2}{6} \\
&= \frac{x^2 - 54y^2}{6}
\end{aligned}$$

$$\begin{aligned}
(6) \quad \frac{(x-2y)^2}{3} - \frac{x(2x-3y)}{4} + \frac{(7x-4y)y}{12} &= \frac{4(x-2y)^2 - 3x(2x-3y) + (7x-4y)y}{12} \\
&= \frac{4(x^2 - 4xy + 4y^2) - 3x(2x-3y) + (7x-4y)y}{12} \\
&= \frac{4x^2 - 16xy + 16y^2 - 6x^2 + 9xy + 7xy - 4y^2}{12} \\
&= \frac{-2x^2 + 12y^2}{12} = \frac{-x^2 + 6y^2}{6}
\end{aligned}$$