

# 式の展開と因数分解

年 組 名前

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■ 次の式を展開せよ。

①  $5x(2x+3)$

②  $4a(a+x-7)$

③  $(x-3)(x+1)$

④  $(a+4)(a-8)$

⑤  $(a-3)(a-6)$

⑥  $(x+9)(x+3)$

⑦  $(x+9)^2$

⑧  $(n-3)^2$

⑨  $(3x-1)^2$

⑩  $(x-2)(x+2)$

⑪  $(a+7)(a-7)$

⑫  $(4a+1)(4a-1)$

■ 次の式を因数分解せよ。

⑬  $5b^2+6b$

⑭  $5ab+3ac$

⑮  $a^2+13a+36$

⑯  $y^2-14y+48$

⑰  $x^2-2x-15$

⑱  $x^2-3x-40$

⑲  $x^2-2x+1$

⑳  $x^2+10x+25$

㉑  $9s^2+12s+4$

㉒  $x^2-36$

㉓  $x^2-64$

㉔  $36x^2-1$

■ 次の式を計算しなさい。

㉕  $x(x-9y)+9x(x+9y)$

㉖  $9(-x+6)+(x+8)(x+3)$

㉗  $(a-b-8)(a-b+8)$

■ 展開の公式を利用して次の値を求めよ。

㉘  $21^2$

㉙  $37 \times 43$

■ 因数分解の公式を利用して次の値を求めよ。

㉚  $64^2-14^2$

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■ 次の式を展開せよ。

$$\begin{aligned} \textcircled{1} \quad & 5x(2x+3) \\ & = 10x^2 + 15x \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & 4a(a+x-7) \\ & = 4a^2 + 4ax - 28a \end{aligned}$$

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

$$\begin{aligned} \textcircled{4} \quad & (a+4)(a-8) \\ & = a^2 - 4a - 32 \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad & (a-3)(a-6) \\ & = a^2 - 9a + 18 \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad & (x+9)(x+3) \\ & = x^2 + 12x + 27 \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & (x+9)^2 \\ & = x^2 + 18x + 81 \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad & (n-3)^2 \\ & = n^2 - 6n + 9 \end{aligned}$$

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

$$\begin{aligned} \textcircled{10} \quad & (x-2)(x+2) \\ & = x^2 - 4 \end{aligned}$$

$$\begin{aligned} \textcircled{11} \quad & (a+7)(a-7) \\ & = a^2 - 49 \end{aligned}$$

$$\begin{aligned} \textcircled{12} \quad & (4a+1)(4a-1) \\ & = 16a^2 - 1 \end{aligned}$$

■ 次の式を因数分解せよ。

$$\begin{aligned} \textcircled{13} \quad & 5b^2 + 6b \\ & = b(5b+6) \end{aligned}$$

$$\begin{aligned} \textcircled{14} \quad & 5ab + 3ac \\ & = a(5b+3c) \end{aligned}$$

$$\begin{aligned} \textcircled{15} \quad & a^2 + 13a + 36 \\ & = (a+4)(a+9) \end{aligned}$$

$$\begin{aligned} \textcircled{16} \quad & y^2 - 14y + 48 \\ & = (y-8)(y-6) \end{aligned}$$

$$\begin{aligned} \textcircled{17} \quad & x^2 - 2x - 15 \\ & = (x+3)(x-5) \end{aligned}$$

$$\begin{aligned} \textcircled{18} \quad & x^2 - 3x - 40 \\ & = (x-8)(x+5) \end{aligned}$$

$$\begin{aligned} \textcircled{19} \quad & x^2 - 2x + 1 \\ & = (x-1)^2 \end{aligned}$$

$$\begin{aligned} \textcircled{20} \quad & x^2 + 10x + 25 \\ & = (x+5)^2 \end{aligned}$$

$$\begin{aligned} \textcircled{21} \quad & 9s^2 + 12s + 4 \\ & = (3s+2)^2 \end{aligned}$$

$$\begin{aligned} \textcircled{22} \quad & x^2 - 36 \\ & = (x+6)(x-6) \end{aligned}$$

$$\begin{aligned} \textcircled{23} \quad & x^2 - 64 \\ & = (x+8)(x-8) \end{aligned}$$

$$\begin{aligned} \textcircled{24} \quad & 36x^2 - 1 \\ & = (6x+1)(6x-1) \end{aligned}$$

■ 次の式を計算しなさい。

$$\begin{aligned} \textcircled{25} \quad & x(x-9y) + 9x(x+9y) \\ & = x(x-9y) + 9x(x+9y) \\ & = (x^2 - 9xy) + 9(x^2 + 9xy) \\ & = x^2 - 9xy + 9x^2 + 81xy \\ & = 10x^2 + 72xy \end{aligned}$$

$$\begin{aligned} \textcircled{26} \quad & 9(-x+6) + (x+8)(x+3) \\ & = 9(-x+6) + (x+8)(x+3) \\ & = 9(-x+6) + (x^2 + 11x + 24) \\ & = -9x + 54 + x^2 + 11x + 24 \\ & = x^2 + 2x + 78 \end{aligned}$$

$$\begin{aligned} \textcircled{27} \quad & (a-b-8)(a-b+8) \\ & a-b = X \text{ とおくと} \\ & (X-8)(X+8) \\ & = X^2 - 64 \\ & = (a-b)^2 - 64 \\ & = a^2 - 2ab + b^2 - 64 \end{aligned}$$

■ 展開の公式を利用して次の値を求めよ。

$$\begin{aligned} \textcircled{28} \quad & 21^2 \\ & = (20+1)^2 \\ & = 400 + 40 + 1 \\ & = 441 \end{aligned}$$

$$\begin{aligned} \textcircled{29} \quad & 37 \times 43 \\ & = (40-3) \times (40+3) \\ & = 40^2 - 3^2 \\ & = 1600 - 9 \\ & = 1591 \end{aligned}$$

$$\begin{aligned} \textcircled{30} \quad & 64^2 - 14^2 \\ & = (64+14) \times (64-14) \\ & = 78 \times 50 \\ & = 3900 \end{aligned}$$