

B-22 単項式と多項式の乗法と除法

正答数

組 番 名前

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● 次の計算をしなさい。

$$\begin{aligned} \textcircled{1} \quad & 3a(2b+1) \\ & = 6ab+3a \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & -4x(2x+5y) \\ & = -8x^2-20xy \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & (4ab-12a) \div 2a \\ & = 2b-6 \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad & (-36x^2+9x) \div (-3x) \\ & = 12x-3 \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad & (20a+35b) \times \left(-\frac{1}{5}a\right) \\ & = -4a^2-7ab \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad & (6a^2-4ab) \div \frac{1}{2}a \\ & = 12a-8b \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & 5y(2x+3y-z) \\ & = 10xy+15y^2-5yz \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad & (6x^3-4x^2y) \div \frac{2}{3}x \\ & = 9x^2-6xy \end{aligned}$$

B-23 式の展開

正答数

組 番 名前

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● 次の式を展開しなさい。

$$\begin{aligned} \textcircled{1} \quad & (a+1)(2a+5) \\ & = 2a^2 + 7a + 5 \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & (3x+1)(x-3) \\ & = 3x^2 - 8x - 3 \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & (1+3a)(4-2a) \\ & = -6a^2 + 10a + 4 \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad & (x-3)(1-2x) \\ & = -2x^2 + 7x - 3 \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad & (3x+2y)(x+6y) \\ & = 3x^2 + 20xy + 12y^2 \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad & (a+4b)(2a-b) \\ & = 2a^2 + 7ab - 4b^2 \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & (4a-3b)(a+4b) \\ & = 4a^2 + 13ab - 12b^2 \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad & (-x+3y)(3x-5y) \\ & = -3x^2 + 14xy - 15y^2 \end{aligned}$$

B-24 $(x+a)(x+b)$ の展開

正答数

組 番 名前

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● 次の式を展開しなさい。

$$\begin{aligned} \textcircled{1} \quad & (x+3)(x+2) \\ & = x^2 + 5x + 6 \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & (x+1)(x+8) \\ & = x^2 + 9x + 8 \end{aligned}$$

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

$$\begin{aligned} \textcircled{4} \quad & (x-2)(x+6) \\ & = x^2 + 4x - 12 \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad & (x+5)(x-9) \\ & = x^2 - 4x - 45 \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad & (a+7)(a-2) \\ & = a^2 + 5a - 14 \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & (x-5)(x-6) \\ & = x^2 - 11x + 30 \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad & (x-3)(x-9) \\ & = x^2 - 12x + 27 \end{aligned}$$

B-25 $(x+a)^2$, $(x-a)^2$ の展開

正答数

組 番 名前

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● 次の式を展開しなさい。

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

$$\begin{aligned} \textcircled{2} \quad (x+4)^2 \\ = x^2 + 8x + 16 \end{aligned}$$

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

$$\begin{aligned} \textcircled{4} \quad (6+a)^2 \\ = a^2 + 12a + 36 \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad (x-2)^2 \\ = x^2 - 4x + 4 \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad (x-10)^2 \\ = x^2 - 20x + 100 \end{aligned}$$

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

$$\begin{aligned} \textcircled{8} \quad (a-5)^2 \\ = a^2 - 10a + 25 \end{aligned}$$

B-26 $(x+a)(x-a)$ の展開

正答数

組 番 名前

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● 次の式を展開しなさい。

$$\begin{aligned} \textcircled{1} \quad & (x+9)(x-9) \\ & = x^2 - 81 \end{aligned}$$

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

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

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

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

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

$$\begin{aligned} \textcircled{7} \quad & (x-y)(x+y) \\ & = x^2 - y^2 \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad & \left(x + \frac{1}{3}\right) \left(x - \frac{1}{3}\right) \\ & = x^2 - \frac{1}{9} \end{aligned}$$

B-27 いろいろな式の展開①

正答数

組 番 名前

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● 次の式を展開しなさい。

$$\begin{aligned} \textcircled{1} \quad & (2x+3)(2x-1) \\ & = 4x^2 + 4x - 3 \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & (4x+5)^2 \\ & = 16x^2 + 40x + 25 \end{aligned}$$

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

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

$$\begin{aligned} \textcircled{5} \quad & (4x+y)(4x-y) \\ & = 16x^2 - y^2 \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad & (6a+7b)(6a-7b) \\ & = 36a^2 - 49b^2 \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & (x+1)(x-3) + (x+5)^2 \\ & = x^2 - 2x - 3 + x^2 + 10x + 25 \\ & = 2x^2 + 8x + 22 \end{aligned}$$

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

B-28 いろいろな式の展開②

正答数

組 番 名前

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● 次の式を展開しなさい。

$$\begin{aligned}\textcircled{1} \quad & (x-3y)(x-3y+8) \\ &= M(M+8) \\ &= M^2+8M \\ &= (x-3y)^2+8(x-3y) \\ &= x^2-6xy+9y^2+8x-24y\end{aligned}$$

$$\begin{aligned}\textcircled{2} \quad & (x+y+5)(x+y-2) \\ &= (M+5)(M-2) \\ &= M^2+3M-10 \\ &= (x+y)^2+3(x+y)-10 \\ &= x^2+2xy+y^2+3x+3y-10\end{aligned}$$

$$\begin{aligned}\textcircled{3} \quad & (x-2y+4)^2 \\ &= (M+4)^2 \\ &= M^2+8M+16 \\ &= (x-2y)^2+8(x-2y)+16 \\ &= x^2-4xy+4y^2+8x-16y+16\end{aligned}$$

$$\begin{aligned}\textcircled{4} \quad & (x-y+7)(x-y-7) \\ &= (M+7)(M-7) \\ &= M^2-7^2 \\ &= (x-y)^2-49 \\ &= x^2-2xy+y^2-49\end{aligned}$$

$$\begin{aligned}\textcircled{5} \quad & (a+b+1)(a-b+1) \\ &= (a+1+b)(a+1-b) \\ &= (M+b)(M-b) \\ &= M^2-b^2 \\ &= (a+1)^2-b^2 \\ &= a^2+2a+1-b^2\end{aligned}$$

$$\begin{aligned}\textcircled{6} \quad & (x+3y-2)(x-3y+2) \\ &= \{x+(3y-2)\}\{x-(3y-2)\} \\ &= (x+M)(x-M) \\ &= x^2-M^2 \\ &= x^2-(3y-2)^2 \\ &= x^2-(9y^2-12y+4) \\ &= x^2-9y^2+12y-4\end{aligned}$$

B-29 因数分解①

正答数

組 番 名前

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● 次の式を因数分解しなさい。

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

$$\begin{aligned} \textcircled{2} \quad & 4a - 6b \\ & = 2(2a - 3b) \end{aligned}$$

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

$$\begin{aligned} \textcircled{4} \quad & 18a^2 - 12a \\ & = 6a(3a - 2) \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad & 2xy + xy^2 \\ & = xy(2 + y) \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad & 21a^2b - 14ab^2 \\ & = 7ab(3a - 2b) \end{aligned}$$

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

$$\begin{aligned} \textcircled{8} \quad & 6a^2b + 8b - 4b^2 \\ & = 2b(3a^2 + 4 - 2b) \end{aligned}$$

B-30 因数分解②

正答数

組 番 名前

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● 次の式を因数分解しなさい。

$$\begin{aligned} \textcircled{1} \quad & x^2 + 4x + 3 \\ & = (x + 3)(x + 1) \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & x^2 + 6x + 8 \\ & = (x + 4)(x + 2) \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & a^2 - 8a + 15 \\ & = (a - 3)(a - 5) \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad & x^2 - 5x + 6 \\ & = (x - 2)(x - 3) \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad & a^2 + 5a - 14 \\ & = (a + 7)(a - 2) \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad & x^2 + 7x - 30 \\ & = (x + 10)(x - 3) \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & x^2 - 3x - 40 \\ & = (x + 5)(x - 8) \end{aligned}$$

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

B-31 因数分解③

正答数

組 番 名前

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● 次の式を因数分解しなさい。

$$\begin{aligned} \textcircled{1} \quad & x^2 + 4x + 4 \\ & = (x + 2)^2 \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & x^2 + 16x + 64 \\ & = (x + 8)^2 \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & a^2 + 10a + 25 \\ & = (a + 5)^2 \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad & x^2 + 14x + 49 \\ & = (x + 7)^2 \end{aligned}$$

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

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

$$\begin{aligned} \textcircled{7} \quad & x^2 - 12x + 36 \\ & = (x - 6)^2 \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad & x^2 - 8x + 16 \\ & = (x - 4)^2 \end{aligned}$$

B-32 因数分解④

正答数

組 番 名前

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● 次の式を因数分解しなさい。

① $x^2 - 1$

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

② $x^2 - 9$

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

③ $x^2 - 49$

$$= (x + 7)(x - 7)$$

④ $x^2 - 16$

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

⑤ $x^2 - 25$

$$= (x + 5)(x - 5)$$

⑥ $x^2 - 64$

$$= (x + 8)(x - 8)$$

⑦ $x^2 - 81$

$$= (x + 9)(x - 9)$$

⑧ $x^2 - 36$

$$= (x + 6)(x - 6)$$

B-33 因数分解⑤

正答数

組 番 名前

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● 次の式を因数分解しなさい。

$$\begin{aligned} \textcircled{1} \quad & x^2 + 12xy + 36y^2 \\ & = (x + 6y)^2 \end{aligned}$$

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

$$\begin{aligned} \textcircled{3} \quad & 81a^2 - 1 \\ & = (9a + 1)(9a - 1) \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad & 25x^2 - 36y^2 \\ & = (5x + 6y)(5x - 6y) \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad & 2a^2 + 8a + 6 \\ & = 2(a^2 + 4a + 3) \\ & = 2(a + 3)(a + 1) \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad & 3x^2 + 9x - 30 \\ & = 3(x^2 + 3x - 10) \\ & = 3(x + 5)(x - 2) \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & 6x^2 - 24xy + 24y^2 \\ & = 6(x^2 - 4xy + 4y^2) \\ & = 6(x - 2y)^2 \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad & 2a^2 - 18b^2 \\ & = 2(a^2 - 9b^2) \\ & = 2(a + 3b)(a - 3b) \end{aligned}$$

B-34 因数分解⑥

正答数

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● 次の式を因数分解しなさい。

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

$$\begin{aligned}\textcircled{2} \quad & (x-5)^2 + 8(x-5) + 16 \\ &= M^2 + 8M + 16 \\ &= (M+4)^2 \\ &= (x-5+4)^2 \\ &= (x-1)^2\end{aligned}$$

$$\begin{aligned}\textcircled{3} \quad & (x+7)^2 - 49 \\ &= M^2 - 7^2 \\ &= (M+7)(M-7) \\ &= (x+7+7)(x+7-7) \\ &= x(x+14)\end{aligned}$$

$$\begin{aligned}\textcircled{4} \quad & (2x+1)^2 + 5(2x+1) - 6 \\ &= M^2 + 5M - 6 \\ &= (M+6)(M-1) \\ &= (2x+1+6)(2x+1-1) \\ &= 2x(2x+7)\end{aligned}$$

$$\begin{aligned}\textcircled{5} \quad & xy + 6x + y + 6 \\ &= x(y+6) + (y+6) \\ &= (x+1)(y+6)\end{aligned}$$

$$\begin{aligned}\textcircled{6} \quad & ab - 9a - b + 9 \\ &= a(b-9) - (b-9) \\ &= (a-1)(b-9)\end{aligned}$$

$$\begin{aligned}\textcircled{7} \quad & xy + 12y - 5x - 60 \\ &= y(x+12) - 5(x+12) \\ &= (x+12)(y-5)\end{aligned}$$

$$\begin{aligned}\textcircled{8} \quad & 18xy + 12x + 21y + 14 \\ &= 6x(3y+2) + 7(3y+2) \\ &= (6x+7)(3y+2)\end{aligned}$$

B-35 式の計算の活用

正答数

組 番 名前

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1 乗法公式を使って、次の計算をなさい。

① 104×96

$$= (100 + 4)(100 - 4)$$

$$= 100^2 - 4^2$$

$$= 9984$$

② 47×53

$$= (50 - 3)(50 + 3)$$

$$= 50^2 - 3^2$$

$$= 2491$$

③ 42^2

$$= (40 + 2)^2$$

$$= 1600 + 160 + 4$$

$$= 1764$$

④ 199^2

$$= (200 - 1)^2$$

$$= 40000 - 400 + 1$$

$$= 39601$$

2 因数分解の公式を使って、次の計算をなさい。

① $57^2 - 43^2$

$$= (57 + 43)(57 - 43)$$

$$= 100 \times 14$$

$$= 1400$$

② $35^2 - 15^2$

$$= (35 + 15)(35 - 15)$$

$$= 50 \times 20$$

$$= 1000$$

③ $85^2 - 84^2$

$$= (85 + 84)(85 - 84)$$

$$= 169 \times 1$$

$$= 169$$

④ $201^2 - 200^2$

$$= (201 + 200)(201 - 200)$$

$$= 401 \times 1$$

$$= 401$$