

展開と因数分解 [単項式と多項式の乗法]

(単項式)×(多項式),(多項式)×(単項式)

分配法則を利用して計算

$$a(b + c) = ab + ac \quad (a + b)c = ac + bc$$

<例> $-a(b + c + 4)$

$$\begin{aligned} &= (-a) \times b + (-a) \times c + (-a) \times 4 \\ &= -ab - ac - 4a \end{aligned}$$

$$2x(x + 4)$$

$$\begin{aligned} &= 2x \times x + 2x \times 4 \\ &= 2x^2 + 8x \end{aligned}$$

$$(x - y + 3) \times (-2y)$$

$$\begin{aligned} &= x \times (-2y) - y \times (-2y) + 3 \times (-2y) \\ &= -2xy + 2y^2 - 6y \end{aligned}$$

*同じ文字の積は
累乗の指数で表現

<確認問題>

次の計算をせよ。

(1) $2a(3b + 4)$

(5) $(2a - 5) \times (-a)$

(2) $-2x(a + b)$

(6) $(4a + 8) \times \left(-\frac{1}{2}a\right)$

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

(7) $5x(x^2 + 2x + 3)$

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

(8) $(12x^2 + 24x - 6) \times \left(-\frac{1}{3}a\right)$

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次の計算をせよ。

(1) $2a(3b+4)$

$$\begin{aligned} 2a(3b+4) &= 2a \times 3b + 2a \times 4 \\ &= 6ab + 8a \end{aligned}$$

(2) $-2x(a+b)$

$$\begin{aligned} -2x(a+b) &= -2x \times a + (-2x) \times b \\ &= -2ax - 2bx \end{aligned}$$

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

$$\begin{aligned} -5x(x-y) &= -5x \times x - (-5x) \times y \\ &= -5x^2 + 5xy \end{aligned}$$

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

$$\begin{aligned} -\frac{5}{3}x(3y+6) &= -\frac{5}{3}x \times 3y + \left(-\frac{5}{3}x\right) \\ &= -5xy - 10x \end{aligned}$$

(5) $(2a-5) \times (-a)$

$$\begin{aligned} (2a-5) \times (-a) &= 2a \times (-a) - 5 \times (-a) \\ &= -2a^2 + 5a \end{aligned}$$

(6) $(4a+8) \times \left(-\frac{1}{2}a\right)$

$$\begin{aligned} (4a+8) \times \left(-\frac{1}{2}a\right) &= 4a \times \left(-\frac{1}{2}a\right) + 8 \times \left(-\frac{1}{2}a\right) \\ &= -2a^2 - 4a \end{aligned}$$

(7) $5x(x^2+2x+3)$

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

(8) $(12x^2+24x-6) \times \left(-\frac{1}{3}a\right)$

$$\begin{aligned} (12x^2+24x-6) \times \left(-\frac{1}{3}a\right) &= 12x^2 \times \left(-\frac{1}{3}a\right) + 24x \times \left(-\frac{1}{3}a\right) - 6 \times \left(-\frac{1}{3}a\right) \\ &= -4ax^2 - 8ax + 2a \end{aligned}$$