

□1 次の式を因数分解せよ。

(1) $xy^2 - 2xy$

(2) $4x^2 - 4x + 1$

(3) $9x^2 + 12xy + 4y^2$

(4) $64x^2y^2 - 25$

(5) $x^2 - 5x + 6$

(6) $x^2 - 6x - 16$

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

(8) $6x^2 + x - 15$

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

(10) $(2a - b)^2 + 7(2a - b)$

□2 次の計算をせよ。

(1) $(5x - 2y) - (3x + 7y)$ (2) $(x - 6y) - (2x - 3y)$ (3) $5(2x + 3y) - 2(8x - 5y)$

(4) $\frac{3x+2}{4} + \frac{x+2}{2}$ (5) $\frac{3x+4}{2} - \frac{5x+2}{6}$ (6) $\frac{2x+1}{2} - \frac{x-2}{3}$

□3 次の整式 A , B について, $A + B$, $A - B$ を計算せよ。

(1) $A = 6x^2 + 2x - 3$, $B = 3x^2 - 5x + 4$

(2) $A = -3x^2 - 7x + 2$, $B = 5x^2 - 4$

□4 $A = 3x^2 - 2x + 1$, $B = -2x^2 + 4x - 3$ とするとき, 次の計算をせよ。

(1) $3A + 2B$ (2) $5A - 3B$

□5 次の計算をせよ。

(1) $5x^3 \times 3x^4$ (2) $2a^3b \times (-9ab^5)$ (3) $(-2x^2)^3$

(4) $(2a^3)^2 \times (-3a)$ (5) $(4x^2y)^3 \times (-x^5y^3)^2$

□ (1) $xy^2 - 2xy = xy \times y - 2 \times xy = xy(y - 2)$

(2) $4x^2 - 4x + 1 = (2x)^2 - 2 \times 2x \times 1 + 1^2 = (2x - 1)^2$

(3) $9x^2 + 12xy + 4y^2 = (3x)^2 + 2 \times 3x \times 2y + (2y)^2 = (3x + 2y)^2$

(4) $64x^2y^2 - 25 = (8xy)^2 - 5^2 = (8xy + 5)(8xy - 5)$

(5) 和が-5, 積が6となるのは-2と3より、

$$x^2 - 5x + 6 = (x - 2)(x - 3)$$

(6) 和が-6, 積が-16となるのは-8と2であるから

$$x^2 - 6x - 16 = (x - 8)(x + 2)$$

(7) 積が2, 積が-5となることから

$$2x^2 - 3x - 5 = (x + 1)(2x - 5)$$

$$\begin{array}{r} 2 \quad -5 \\ \hline 1 \quad +1 \longrightarrow +2 \\ 2 \quad -5 \longrightarrow -5 \\ \hline \quad \quad -3 \end{array}$$

(8) 積が6, 積が-15となることから

$$6x^2 + x - 15 = (2x - 3)(3x + 5)$$

$$\begin{array}{r} 6 \quad -15 \\ \hline 2 \quad -3 \longrightarrow -9 \\ 3 \quad +5 \longrightarrow +10 \\ \hline \quad \quad +1 \end{array}$$

(9) $x + 2y = A$ とおくと

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

(10) $2a - b = A$ とおくと

$$\begin{aligned} & (2a - b)^2 + 7(2a - b) \\ &= A^2 + 7A = A(A + 7) \\ &= (2a - b)(2a - b + 7) \end{aligned}$$

□ (1) $(5x - 2y) - (3x + 7y) = 5x - 2y - 3x - 7y = 5x - 3x - 2y - 7y = 2x - 9y$

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

(3) $5(2x + 3y) - 2(8x - 5y) = 10x + 15y - 16x + 10y = -6x + 25y$

(4) $\frac{3x+2}{4} + \frac{x+2}{2} = \frac{3x+2}{4} + \frac{2(x+2)}{4} = \frac{3x+2+2(x+2)}{4} = \frac{3x+2+2x+4}{4} = \frac{5x+6}{4}$

(5) $\frac{3x+4}{2} - \frac{5x+2}{6} = \frac{3(3x+4)}{6} - \frac{5x+2}{6}$

$$= \frac{3(3x+4) - (5x+2)}{6} = \frac{9x+12-5x-2}{6}$$

$$= \frac{4x+10}{6} = \frac{2x+5}{3} \leftarrow \text{約分}$$

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

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

3

$$(1) A+B=(6x^2+2x-3)+(3x^2-5x+4)=6x^2+2x-3+3x^2-5x+4=9x^2-3x+1$$

$$A-B=(6x^2+2x-3)-(3x^2-5x+4)=6x^2+2x-3-3x^2+5x-4=3x^2+7x-7$$

$$(2) A+B=(-3x^2-7x+2)+(5x^2-4)=-3x^2-7x+2+5x^2-4=2x^2-7x-2$$

$$A-B=(-3x^2-7x+2)-(5x^2-4)=-3x^2-7x+2-5x^2+4=-8x^2-7x+6$$

4

$$(1) 3A+2B=3(3x^2-2x+1)+2(-2x^2+4x-3)$$

$$=9x^2-6x+3-4x^2+8x-6=5x^2+2x-3$$

$$(2) 5A-3B=5(3x^2-2x+1)-3(-2x^2+4x-3)$$

$$=15x^2-10x+5+6x^2-12x+9=21x^2-22x+14$$

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$$(1) 5x^3 \times 3x^4 = 5 \times 3 \times x^{3+4} = 15x^7$$

$$(2) 2a^3b \times (-9ab^5) = 2 \times (-9) \times a^{3+1} \times b^{1+5} = -18a^4b^6$$

$$(3) (-2x^2)^3 = (-2)^3 \times (x^2)^3 = -8x^6$$

$$(4) (2a^3)^2 \times (-3a) = 2^2 \times (a^3)^2 \times (-3a) = 2^2 \times (-3) \times a^{6+1} = -12a^7$$

$$\begin{aligned}
(5) (4x^2y)^3 \times (-x^5y^3)^2 &= 4^3 \times (x^2)^3 \times y^3 \times (-1)^2 \times (x^5)^2 \times (y^3)^2 \\
&= 4^3 \times (-1)^2 \times x^{6+10} \times y^{3+6} = 64x^{16}y^9
\end{aligned}$$