

解説

練習 5 (1) 3次式, 定数項 $by^2 + c$

(2) 2次式, 定数項 $ax^3 + c$

解説

練習 6 (1) $(a+2)x + (4a^2 - 3a)$

(2) $x^2 + (3y-1)x + (2y^2 - 3y - 2)$

解説

練習 7 (1) $A + B = (2x^2 + 3x - 1) + (4x^2 - 5x - 6) = (2+4)x^2 + (3-5)x + (-1-6)$
 $= 6x^2 - 2x - 7$

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

$$= (2-4)x^2 + (3+5)x + (-1+6) = -2x^2 + 8x + 5$$

(2) $A + B = (4x^3 - 3x^2 - 2x + 5) + (2x^3 - 3x^2 + 7) = (4+2)x^3 + (-3-3)x^2 - 2x + (5+7)$
 $= 6x^3 - 6x^2 - 2x + 12$

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

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

$$= 2x^3 - 2x - 2$$

解説

練習 8 (1) $A + 2B = (x^2 + 4x - 3) + 2(2x^2 - x + 4) = x^2 + 4x - 3 + 4x^2 - 2x + 8$
 $= (1+4)x^2 + (4-2)x + (-3+8)$

$$= 5x^2 + 2x + 5$$

(2) $2A - 3B = 2(x^2 + 4x - 3) - 3(2x^2 - x + 4) = 2x^2 + 8x - 6 - 6x^2 + 3x - 12$
 $= (2-6)x^2 + (8+3)x + (-6-12)$

$$= -4x^2 + 11x - 18$$

解説

練習 10 (1) $4x^2(2x^2 - 3x + 5) = 4x^2 \times 2x^2 + 4x^2 \times (-3x) + 4x^2 \times 5$
 $= 8x^4 - 12x^3 + 20x^2$

(2) $(3a^2 - a - 2) \times (-2a) = 3a^2 \times (-2a) + (-a) \times (-2a) + (-2) \times (-2a)$
 $= -6a^3 + 2a^2 + 4a$

解説

練習 11 (1) $(2x-1)(4x^2+3) = (2x-1) \cdot 4x^2 + (2x-1) \cdot 3 = 8x^3 - 4x^2 + 6x - 3$

(2) $(2x^2 + x - 3)(x - 2) = (2x^2 + x - 3)x + (2x^2 + x - 3) \cdot (-2)$
 $= 2x^3 + x^2 - 3x - 4x^2 - 2x + 6$

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

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

$$\begin{aligned}
 (4) \quad (2x+1)(3x^2+x-2) &= 2x(3x^2+x-2) + 1 \cdot (3x^2+x-2) \\
 &= 6x^3 + 2x^2 - 4x + 3x^2 + x - 2 \\
 &= 6x^3 + 5x^2 - 3x - 2
 \end{aligned}$$

解説

練習 1 2 (1) $(2x+5)^2 = (2x)^2 + 2 \cdot 2x \cdot 5 + 5^2 = 4x^2 + 20x + 25$

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

(3) $(5x+4y)(5x-4y) = (5x)^2 - (4y)^2 = 25x^2 - 16y^2$

(4) $(x+1)(x+5) = x^2 + (1+5)x + 1 \cdot 5 = x^2 + 6x + 5$

(5) $(x-3)(x+8) = x^2 + (-3+8)x + (-3) \cdot 8 = x^2 + 5x - 24$

(6) $(x-2)(x-4) = x^2 + \{(-2) + (-4)\}x + (-2) \cdot (-4) = x^2 - 6x + 8$

(7) $(x+2y)(x+5y) = x^2 + (2y+5y)x + 2y \cdot 5y = x^2 + 7xy + 10y^2$

(8) $(x+y)(x-4y) = x^2 + (y-4y)x + y \cdot (-4y) = x^2 - 3xy - 4y^2$

(9) $(x-2a)(x-7a) = x^2 + (-2a-7a)x + (-2a) \cdot (-7a) = x^2 - 9ax + 14a^2$

解説

練習 1 3 (1) $(2x+1)(4x+5) = 2 \cdot 4x^2 + (2 \cdot 5 + 1 \cdot 4)x + 1 \cdot 5 = 8x^2 + 14x + 5$

(2) $(x+4)(2x-3) = 1 \cdot 2x^2 + \{1 \cdot (-3) + 4 \cdot 2\}x + 4 \cdot (-3) = 2x^2 + 5x - 12$

(3) $(3x-7)(x+2) = 3 \cdot 1x^2 + \{3 \cdot 2 + (-7) \cdot 1\}x + (-7) \cdot 2 = 3x^2 - x - 14$

(4) $(2x-5)(2x-1) = 2 \cdot 2x^2 + \{2 \cdot (-1) + (-5) \cdot 2\}x + (-5) \cdot (-1) = 4x^2 - 12x + 5$

$$(5) \quad (x+2y)(3x-y) = 1 \cdot 3x^2 + \{1 \cdot (-y) + 2y \cdot 3\}x + 2y \cdot (-y) = 3x^2 + 5xy - 2y^2$$

$$(6) \quad (3x-2a)(4x-3a) = 3 \cdot 4x^2 + \{3 \cdot (-3a) + (-2a) \cdot 4\}x + (-2a) \cdot (-3a) \\ = 12x^2 - 17ax + 6a^2$$

解説

$$\text{練習 1 4} \quad (1) \quad (3a-b+2)(3a-b-2) = \{(3a-b)+2\}\{(3a-b)-2\} = (3a-b)^2 - 2^2 \\ = 9a^2 - 6ab + b^2 - 4$$

$$(2) \quad (x-y+3)(x-y-2) = \{(x-y)+3\}\{(x-y)-2\} = (x-y)^2 + (x-y) - 6 \\ = x^2 - 2xy + y^2 + x - y - 6$$

解説

$$\text{練習 1 5} \quad (1) \quad (x^2+x+1)(x^2-x+1) = (x^2+x+1)x^2 + (x^2+x+1) \cdot (-x) + (x^2+x+1) \cdot 1 \\ = x^4 + x^3 + x^2 - x^3 - x^2 - x + x^2 + x + 1 \\ = x^4 + x^2 + 1$$

$$(2) \quad x^2+1 = A \text{ とおくと}$$

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

解説

$$\text{練習 1 7} \quad (1) \quad (x+1)^2(x-1)^2 = \{(x+1)(x-1)\}^2 = (x^2-1)^2 \\ = (x^2)^2 - 2 \cdot x^2 \cdot 1 + 1^2 = x^4 - 2x^2 + 1$$

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