

小テスト解答

No.3 数と式 整式, 整式の加法・減法・乗法

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

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

(各 2 点)

$$\begin{aligned} 2. (1) \quad & (-2x^2)^3 = (-2)^3 \cdot (x^2)^3 \\ &= -8x^6 \end{aligned}$$

$$\begin{aligned} (2) \quad & 16xy^3 \times \left(\frac{1}{2}x^2y\right)^3 = 16xy^3 \times \frac{1}{8}x^6y^3 \\ &= 2x^7y^6 \end{aligned}$$

(各 2 点)

$$\begin{aligned} 3. (1) \quad & (x - 3)(2x^2 + x + 3) = x(2x^2 + x + 3) - 3(2x^2 + x + 3) \\ &= 2x^3 + x^2 + 3x - 6x^2 - 3x - 9 \\ &= 2x^3 - 5x^2 - 9 \end{aligned}$$

$$\begin{aligned} (2) \quad & (x - y + 4)(x - y - 8) = (x - y)^2 - 4(x - y) - 32 \\ &= x^2 - 2xy + y^2 - 4x + 4y - 32 \end{aligned}$$

$$\begin{aligned} (3) \quad & (a + 2b - c)^2 = a^2 + (2b)^2 + (-c)^2 + 2 \cdot a \cdot 2b + 2 \cdot 2b \cdot (-c) + 2 \cdot (-c) \cdot a \\ &= a^2 + 4b^2 + c^2 + 4ab - 4bc - 2ca \end{aligned}$$

(別解)

$$\begin{aligned} (a + 2b - c)^2 &= \{(a + 2b) - c\}^2 \\ &= (a + 2b)^2 - 2(a + 2b)c + c^2 \\ &= a^2 + 4ab + 4b^2 - 2ac - 4bc + c^2 \\ &= a^2 + 4b^2 + c^2 + 4ab - 4bc - 2ca \end{aligned}$$

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

(別解)

$$\begin{aligned} (x + 1)(x + 2)(x - 1)(x - 2) &= \{(x + 1)(x + 2)\}\{(x - 1)(x - 2)\} \\ &= (x^2 + 3x + 2)(x^2 - 3x + 2) \\ &= \{(x^2 + 2) + 3x\}\{(x^2 + 2) - 3x\} \\ &= (x^2 + 2)^2 - 9x^2 \\ &= x^4 + 4x^2 + 4 - 9x^2 \\ &= x^4 - 5x^2 + 4 \end{aligned}$$

(各 3 点)