

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

$$\begin{aligned}
 (2) \quad & (7x^3 - 4x - 5) + x(3x + 6 - 2x^2) - 3x(2x^2 - x + 4) \\
 & = 7x^3 - 4x - 5 + 3x^2 + 6x - 2x^3 - 6x^3 + 3x^2 - 12x \\
 & = (7 - 2 - 6)x^3 + (3 + 3)x^2 + (-4 + 6 - 12)x - 5 \\
 & = -x^3 + 6x^2 - 10x - 5
 \end{aligned}$$

$$\boxed{2} \quad (1) \quad (2m + 5)(m - 2) = 2m^2 + \{2 \cdot (-2) + 5 \cdot 1\}m + 5 \cdot (-2) = 2m^2 + m - 10$$

$$(2) \quad (6a - 5b)(6a + 5b) = (6a)^2 - (5b)^2 = 36a^2 - 25b^2$$

$$(3) \quad (3 - 2x)(1 + x) = 3 + 3x - 2x - 2x^2 = -2x^2 + x + 3$$

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

$$(5) \quad (x^2 + 2x + 2)(x^2 - 2x + 2) = (x^2 + 2)^2 - (2x)^2 = (x^4 + 4x^2 + 4) - 4x^2 = x^4 + 4$$

$$\begin{aligned}
 (6) \quad & (x + y - z)(x - y + z) = \{x + (y - z)\}\{x - (y - z)\} \\
 & = x^2 - (y - z)^2 \\
 & = x^2 - (y^2 - 2yz + z^2) \\
 & = x^2 - y^2 + 2yz - z^2
 \end{aligned}$$

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

$$(8) \quad (x - 1)(x + 1)(x - 2)(x + 2) = (x^2 - 1)(x^2 - 4) = x^4 - 5x^2 + 4$$

$$\begin{aligned}
 (9) \quad & (x + 4)(x + 2)(x - 1)(x - 3) = (x + 4)(x - 3) \times (x + 2)(x - 1) \\
 & = (x^2 + x - 12)(x^2 + x - 2) \\
 & = (x^2 + x)^2 - 14(x^2 + x) + 24 \\
 & = x^4 + 2x^3 + x^2 - 14x^2 - 14x + 24 \\
 & = x^4 + 2x^3 - 13x^2 - 14x + 24
 \end{aligned}$$

$$\boxed{3} \quad (1) \quad 2ax^2 - 8a = 2a(x^2 - 4) = 2a(x + 2)(x - 2)$$

$$\begin{aligned}
 (2) \quad & ax^2 + by^2 - ay^2 - bx^2 = (a - b)x^2 + (b - a)y^2 \\
 & = (a - b)x^2 - (a - b)y^2 \\
 & = (a - b)(x^2 - y^2) \\
 & = (a - b)(x + y)(x - y)
 \end{aligned}$$

$$\begin{aligned}
 (3) \quad & (x - 4)(3x + 1) + 10 = 3x^2 - 11x - 4 + 10 \\
 & = 3x^2 - 11x + 6 \\
 & = (x - 3)(3x - 2)
 \end{aligned}$$

$$(4) \quad 2n^3 + 3n^2 + n = n(2n^2 + 3n + 1) = n(n + 1)(2n + 1)$$

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

$$\begin{aligned} (2) \quad (x^2 - x)^2 - 8(x^2 - x) + 12 &= (x^2 - x - 2)(x^2 - x - 6) \\ &= (x+1)(x-2)(x+2)(x-3) \end{aligned}$$

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

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

$$\begin{aligned} (5) \quad 3x^2 + 2xy - y^2 + 7x + 3y + 4 &= 3x^2 + (2y+7)x - (y^2 - 3y - 4) \\ &= 3x^2 + (2y+7)x - (y+1)(y-4) \\ &= \{x + (y+1)\}\{3x - (y-4)\} \\ &= (x + y + 1)(3x - y + 4) \end{aligned}$$

$$\begin{aligned} (6) \quad (a+b+c)(ab+bc+ca) - abc &= \{a + (b+c)\}\{(b+c)a + bc\} - abc \\ &= (b+c)a^2 + abc + (b+c)\{(b+c)a + bc\} - abc \\ &= (b+c)\{a^2 + (b+c)a + bc\} \\ &= (b+c)(a+b)(a+c) \\ &= (a+b)(b+c)(c+a) \end{aligned}$$

$$\begin{aligned} \boxed{5} \quad A + B &= (x^2 - 1)a + x^2 - 2x + 1 \\ &= (x+1)(x-1)a + (x-1)^2 \\ &= (x-1)\{(x+1)a + (x-1)\} \\ &= (x-1)\{(a+1)x + a - 1\} \end{aligned}$$

A, B をそれぞれ a について整理すると

$$AB = \{-a + (x^2 - 3x)\}\{x^2a + (x+1)\}$$

a の 1 次の項の係数は

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

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