

● TRIAL A, TRIAL B, 練習問題の解答

1 (1) 係数 3, 次数 3;

 x に着目すると 係数 $3a$, 次数 2

(2) 係数 1, 次数 2;

 y に着目すると 係数 b , 次数 1

(3) 係数 -2, 次数 2;

 a に着目すると 係数 $-2y$, 次数 1

(4) 係数 -1, 次数 4;

 y に着目すると 係数 $-x$, 次数 3

(5) 係数 3, 次数 4;

 x と y に着目すると 係数 $3a$, 次数 3

(6) 係数 -5, 次数 7;

 a と b に着目すると 係数 $-5x^2y^3$, 次数 22 (1) (与式) $= (8+5-10)x + (-1+4) = 3x+3$ 最も次数の高い項は $3x$

よって, この整式の次数は 1

(2) (与式) $= (3-1)x^2 + (1+2)x + (-1+7)$

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

最も次数の高い項は $2x^2$

よって, この整式の次数は 2

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

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

最も次数の高い項は $6x^3$

よって, この整式の次数は 3

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

$$= -3x - 1$$

最も次数の高い項は $-3x$

よって, この整式の次数は 1

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

$$= -x^4 - 2x^2 + 3$$

最も次数の高い項は $-x^4$

よって, この整式の次数は 4

(6) (与式) $= (1+1)a^2 + (-4+6)ab + (4-3)b^2$

$$= 2a^2 + 2ab + b^2$$

どの項も 2 次である。

よって, この整式の次数は 2

3 (1) x に着目すると 3 次式, 定数項 d (2) a に着目すると 2 次式, 定数項 $-b$ (3) y に着目すると 2 次式, 定数項 $2x^2$ (4) x に着目すると 2 次式, 定数項 cy^2+2 4 (1) (与式) $= 5x^3 - 4x^2 + 5x - 2$ (2) (与式) $= (2-1)x^3 + (4-1)x^2 - 2x + (-5+3)$
 $= x^3 + 3x^2 - 2x - 2$ (3) (与式) $= (a^2-3)x^2 + (2a^2-5)x + 1$ (4) (与式) $= 6x^2 - (7y+6)x + (2y^2+5y-12)$ 5 (1) $A+B = (3x-4y-2z) + (-x-4y+2z)$
 $= (3-1)x + (-4-4)y + (-2+2)z$
 $= 2x - 8y$

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

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

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

(3) $A+B = (2a^2-ab+5b^2) + (-3a^2+5ab-b^2)$
 $= (2-3)a^2 + (-1+5)ab + (5-1)b^2$
 $= -a^2 + 4ab + 4b^2$

$$A-B = (2a^2-ab+5b^2) - (-3a^2+5ab-b^2)$$
$$= 2a^2 - ab + 5b^2 + 3a^2 - 5ab + b^2$$
$$= (2+3)a^2 + (-1-5)ab + (5+1)b^2$$
$$= 5a^2 - 6ab + 6b^2$$

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

$$= 4x^3 + 24xy^2$$
$$A-B = (2x^3+6x^2y+12xy^2+8y^3)$$
$$- (2x^3-6x^2y+12xy^2-8y^3)$$
$$= 2x^3 + 6x^2y + 12xy^2 + 8y^3$$
$$- 2x^3 + 6x^2y - 12xy^2 + 8y^3$$
$$= (2-2)x^3 + (6+6)x^2y + (12-12)xy^2$$
$$+ (8+8)y^3$$
$$= 12x^2y + 16y^3$$

$$\begin{aligned} 6 \quad (1) \quad A+3B &= (2x^2-3x+1)+3(x^2+2x-4) \\ &= 2x^2-3x+1+3x^2+6x-12 \\ &= (2+3)x^2+(-3+6)x+(1-12) \\ &= 5x^2+3x-11 \end{aligned}$$

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

$$\begin{aligned} (3) \quad 3A-2B &= 3(2x^2-3x+1)-2(x^2+2x-4) \\ &= 6x^2-9x+3-2x^2-4x+8 \\ &= (6-2)x^2+(-9-4)x+(3+8) \\ &= 4x^2-13x+11 \end{aligned}$$

7 (1) 降べきの順に整理すると

$$\begin{aligned} (\text{与式}) &= -3x^3+(5-6)x^2+(2-7)x+7 \\ &= -3x^3-x^2-5x+7 \end{aligned}$$

昇べきの順に整理すると

$$(\text{与式})=7-5x-x^2-3x^3$$

(2) 降べきの順に整理すると

$$\begin{aligned} (\text{与式}) &= 9x^2+(-3y-2y-7)x+(y-4) \\ &= 9x^2-(5y+7)x+(y-4) \end{aligned}$$

昇べきの順に整理すると

$$(\text{与式})=(y-4)-(5y+7)x+9x^2$$

$$\begin{aligned} 8 \quad (1) \quad (\text{与式}) &= 4x^3+12x-8-8x+10+6x^2 \\ &\quad +4+3x-5x^2 \\ &= 4x^3+(6-5)x^2+(12-8+3)x \\ &\quad +(-8+10+4) \\ &= 4x^3+x^2+7x+6 \end{aligned}$$

$$\begin{aligned} (2) \quad (\text{与式}) &= 4a^3-10a+20+3a-12-3a^2 \\ &\quad -3a^2+4a-7 \\ &= 4a^3+(-3-3)a^2+(-10+3+4)a \\ &\quad +(20-12-7) \\ &= 4a^3-6a^2-3a+1 \end{aligned}$$

$$\begin{aligned} 9 \quad (1) \quad (\text{与式}) &= 2A-B-2C \\ &= 2(2x+y+3z)-(x+2y+z)-2(x+y+2z) \\ &= 4x+2y+6z-x-2y-z-2x-2y-4z \\ &= (4-1-2)x+(2-2-2)y+(6-1-4)z \\ &= x-2y+z \end{aligned}$$

$$\begin{aligned} (2) \quad (\text{与式}) &= A+C-(2A-B-C) \\ &= A+C-2A+B+C=-A+B+2C \\ &= -(2x+y+3z)+(x+2y+z)+2(x+y+2z) \\ &= -2x-y-3z+x+2y+z+2x+2y+4z \\ &= (-2+1+2)x+(-1+2+2)y+(-3+1+4)z \\ &= x+3y+2z \end{aligned}$$

$$10 \quad (1) \quad (\text{与式})=a^{4+2}=a^6$$

$$(2) \quad (\text{与式})=3 \times (-4) \times x^{2+3}=-12x^5$$

$$(3) \quad (\text{与式})=3 \times 5 \times x^{2+1} \times y^{1+3}=15x^3y^4$$

$$(4) \quad (\text{与式})=a^{2 \times 4}=a^8$$

$$(5) \quad (\text{与式})=(-1)^2 \times (x^3)^2=x^{3 \times 2}=x^6$$

$$(6) \quad (\text{与式})=(-4)^3 \times (a^2)^3 \times (b^2)^3=-64a^6b^6$$

$$\begin{aligned} (7) \quad (\text{与式}) &= -x^4y^2 \times (-1)^3x^3y \\ &= [-1 \times (-1)] \times x^{4+3} \times y^{2+1}=x^7y^3 \end{aligned}$$

$$\begin{aligned} (8) \quad (\text{与式}) &= 2ab^2 \times (-3)^3a^6b^3 \\ &= [2 \times (-27)] \times a^{1+6} \times b^{2+3}=-54a^7b^5 \end{aligned}$$

$$\begin{aligned} (9) \quad (\text{与式}) &= a^2b^2c^2 \times (-3)ab^3c \\ &= (-3) \times a^{2+1} \times b^{2+3} \times c^{2+1}=-3a^3b^5c^3 \end{aligned}$$

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

$$\begin{aligned} (2) \quad (\text{与式}) &= a^2 \times (-2a) + 5a \times (-2a) \\ &\quad + (-3) \times (-2a) \\ &= -2a^3 - 10a^2 + 6a \end{aligned}$$

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

$$\begin{aligned} (4) \quad (\text{与式}) &= \frac{a^2}{3} \times 12b^2 + \left(-\frac{ab}{6}\right) \times 12b^2 \\ &\quad + \left(-\frac{b^2}{4}\right) \times 12b^2 \\ &= 4a^2b^2 - 2ab^3 - 3b^4 \end{aligned}$$

$$\begin{aligned} 12 \quad (1) \quad (\text{与式}) &= 3x^2(2x+5)-4(2x+5) \\ &= 6x^3+15x^2-8x-20 \end{aligned}$$

$$\begin{aligned} (2) \quad (\text{与式}) &= (4x-1)x^2+(4x-1) \cdot (-5) \\ &= 4x^3-x^2-20x+5 \end{aligned}$$

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

$$\begin{aligned} (4) \quad (\text{与式}) &= (a^2-2a-2)a+(a^2-2a-2) \cdot 3 \\ &= a^3-2a^2-2a+3a^2-6a-6 \\ &= a^3+a^2-8a-6 \end{aligned}$$

$$\begin{aligned} (5) \quad (\text{与式}) &= (x^2-2xy-y^2)x \\ &\quad + (x^2-2xy-y^2) \cdot (-3y) \\ &= x^3-2x^2y-xy^2-3x^2y+6xy^2+3y^3 \\ &= x^3-5x^2y+5xy^2+3y^3 \end{aligned}$$

$$\begin{aligned} (6) \quad (\text{与式}) &= a(a^2+3ab-2b^2)+2b(a^2+3ab-2b^2) \\ &= a^3+3a^2b-2ab^2+2a^2b+6ab^2-4b^3 \\ &= a^3+5a^2b+4ab^2-4b^3 \end{aligned}$$

$$13 \quad (1) \quad (\text{与式}) = x^2 + 2 \cdot x \cdot 4 + 4^2 \\ = x^2 + 8x + 16$$

$$(2) \quad (\text{与式}) = (4a)^2 + 2 \cdot 4a \cdot 3 + 3^2 \\ = 16a^2 + 24a + 9$$

$$(3) \quad (\text{与式}) = (3x)^2 - 2 \cdot 3x \cdot 1 + 1^2 \\ = 9x^2 - 6x + 1$$

$$(4) \quad (\text{与式}) = a^2 + 2 \cdot a \cdot 7b + (7b)^2 \\ = a^2 + 14ab + 49b^2$$

$$(5) \quad (\text{与式}) = (2x)^2 - 2 \cdot 2x \cdot 5y + (5y)^2 \\ = 4x^2 - 20xy + 25y^2$$

$$(6) \quad (\text{与式}) = a^2 - 3^2 = a^2 - 9$$

$$(7) \quad (\text{与式}) = (x+10)(x-10) \\ = x^2 - 10^2 \\ = x^2 - 100$$

$$(8) \quad (\text{与式}) = (6a)^2 - b^2 = 36a^2 - b^2$$

$$(9) \quad (\text{与式}) = (5x+2y)(5x-2y) \\ = (5x)^2 - (2y)^2 \\ = 25x^2 - 4y^2$$

$$14 \quad (1) \quad (\text{与式}) = x^2 + (1+2)x + 1 \cdot 2 \\ = x^2 + 3x + 2$$

$$(2) \quad (\text{与式}) = x^2 + \{(-4) + 2\}x + (-4) \cdot 2 \\ = x^2 - 2x - 8$$

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

$$(4) \quad (\text{与式}) = a^2 + \{(-2) + (-3)\}a + (-2) \cdot (-3) \\ = a^2 - 5a + 6$$

$$(5) \quad (\text{与式}) = x^2 + (7a+a)x + 7a \cdot a \\ = x^2 + 8ax + 7a^2$$

$$(6) \quad (\text{与式}) = a^2 + (4b-3b)a + 4b \cdot (-3b) \\ = a^2 + ab - 12b^2$$

$$(7) \quad (\text{与式}) = a^2 + (-b+2b)a + (-b) \cdot 2b \\ = a^2 + ab - 2b^2$$

$$(8) \quad (\text{与式}) = x^2 + (-2y-13y)x + (-2y) \cdot (-13y) \\ = x^2 - 15xy + 26y^2$$

$$15 \quad (1) \quad (\text{与式}) = 1 \cdot 3x^2 + (1 \cdot 1 + 2 \cdot 3)x + 2 \cdot 1 \\ = 3x^2 + 7x + 2$$

$$(2) \quad (\text{与式}) = 2 \cdot 4a^2 + \{2 \cdot (-1) + 3 \cdot 4\}a + 3 \cdot (-1) \\ = 8a^2 + 10a - 3$$

$$(3) \quad (\text{与式}) = 3 \cdot 4x^2 + \{3 \cdot 3 + (-2) \cdot 4\}x + (-2) \cdot 3 \\ = 12x^2 + x - 6$$

$$(4) \quad (\text{与式}) = 4 \cdot 1a^2 + \{4 \cdot (-2) + (-3) \cdot 1\}a \\ + (-3) \cdot (-2) \\ = 4a^2 - 11a + 6$$

$$(5) \quad (\text{与式}) = 1 \cdot 2x^2 + (1 \cdot 3y + 4y \cdot 2)x + 4y \cdot 3y \\ = 2x^2 + 11xy + 12y^2$$

$$(6) \quad (\text{与式}) = 2 \cdot 3a^2 + \{2 \cdot (-2b) + (-b) \cdot 3\}a \\ + (-b) \cdot (-2b) \\ = 6a^2 - 7ab + 2b^2$$

$$(7) \quad (\text{与式}) = 5 \cdot 4x^2 + \{5 \cdot 3y + (-y) \cdot 4\}x + (-y) \cdot 3y \\ = 20x^2 + 11xy - 3y^2$$

$$(8) \quad (\text{与式}) = 8 \cdot 3x^2 + \{8 \cdot (-4a) + 9a \cdot 3\}x \\ + 9a \cdot (-4a) \\ = 24x^2 - 5ax - 36a^2$$

$$16 \quad (1) \quad (\text{与式}) = \{(a+2b)+3\}\{(a+2b)-3\} \\ = (a+2b)^2 - 3^2 \\ = a^2 + 4ab + 4b^2 - 9$$

$$(2) \quad (\text{与式}) = \{(3x-2y)-1\}\{(3x-2y)+1\} \\ = (3x-2y)^2 - 1^2 \\ = 9x^2 - 12xy + 4y^2 - 1$$

$$(3) \quad (\text{与式}) = \{(a-b)+4\}\{(a-b)+2\} \\ = (a-b)^2 + (4+2)(a-b) + 4 \cdot 2 \\ = a^2 - 2ab + b^2 + 6a - 6b + 8$$

$$(4) \quad (\text{与式}) = \{(2x+3y)-3\}\{(2x+3y)+6\} \\ = (2x+3y)^2 + (-3+6)(2x+3y) + (-3) \cdot 6 \\ = 4x^2 + 12xy + 9y^2 + 6x + 9y - 18$$

$$17 \quad (1) \quad (\text{与式}) = \{(a-b)+c\}^2 \\ = (a-b)^2 + 2(a-b)c + c^2 \\ = a^2 - 2ab + b^2 + 2ac - 2bc + c^2 \\ = a^2 + b^2 + c^2 - 2ab - 2bc + 2ca$$

$$(2) \quad (\text{与式}) = \{(x+y)-z\}^2 \\ = (x+y)^2 - 2(x+y)z + z^2 \\ = x^2 + 2xy + y^2 - 2xz - 2yz + z^2 \\ = x^2 + y^2 + z^2 + 2xy - 2yz - 2zx$$

$$(3) \quad (\text{与式}) = \{(a-2b)-3c\}^2 \\ = (a-2b)^2 - 2(a-2b) \cdot 3c + 9c^2 \\ = a^2 - 4ab + 4b^2 - 6ac + 12bc + 9c^2 \\ = a^2 + 4b^2 + 9c^2 - 4ab + 12bc - 6ca$$

$$(4) \quad (\text{与式}) = \{(2x-3y)+z\}^2 \\ = (2x-3y)^2 + 2(2x-3y)z + z^2 \\ = 4x^2 - 12xy + 9y^2 + 4xz - 6yz + z^2 \\ = 4x^2 + 9y^2 + z^2 - 12xy - 6yz + 4xz$$

$$18 \quad (1) \quad (\text{与式}) = \{(x-3)(x+3)\}^2 \\ = (x^2-3^2)^2 \\ = (x^2-9)^2 \\ = (x^2)^2 - 2 \cdot x^2 \cdot 9 + 9^2 \\ = x^4 - 18x^2 + 81$$

$$(2) \text{ (与式)} = (a+2b)(a-2b)^2$$

$$= \{a^2 - (2b)^2\}^2$$

$$= (a^2 - 4b^2)^2$$

$$= (a^2)^2 - 2 \cdot a^2 \cdot 4b^2 + (4b^2)^2$$

$$= a^4 - 8a^2b^2 + 16b^4$$

$$(3) \text{ (与式)} = \{(3x-y)(3x+y)\}^2$$

$$= \{(3x)^2 - y^2\}^2$$

$$= (9x^2 - y^2)^2$$

$$= (9x^2)^2 - 2 \cdot 9x^2 \cdot y^2 + (y^2)^2$$

$$= 81x^4 - 18x^2y^2 + y^4$$

$$(4) \text{ (与式)} = (a-2)(a+2) \times (a^2+4)$$

$$= (a^2-4)(a^2+4) = (a^2)^2 - 4^2$$

$$= a^4 - 16$$

$$(5) \text{ (与式)} = (a^2+b^2) \times (a-b)(a+b)$$

$$= (a^2+b^2)(a^2-b^2) = (a^2)^2 - (b^2)^2$$

$$= a^4 - b^4$$

$$(6) \text{ (与式)} = (2x+3y)(2x-3y) \times (4x^2+9y^2)$$

$$= \{(2x)^2 - (3y)^2\} \times (4x^2+9y^2)$$

$$= (4x^2 - 9y^2)(4x^2+9y^2)$$

$$= (4x^2)^2 - (9y^2)^2$$

$$= 16x^4 - 81y^4$$

$$19 \text{ (1) (与式)} = (3a)^2 - 2 \cdot 3a \cdot \frac{1}{2}b + \left(\frac{1}{2}b\right)^2$$

$$= 9a^2 - 3ab + \frac{1}{4}b^2$$

$$(2) \text{ (与式)} = \left(\frac{2}{3}x - \frac{5}{4}y\right) \left(\frac{2}{3}x + \frac{5}{4}y\right)$$

$$= \left(\frac{2}{3}x\right)^2 - \left(\frac{5}{4}y\right)^2 = \frac{4}{9}x^2 - \frac{25}{16}y^2$$

$$(3) \text{ (与式)} = (y^2)^2 + \{3 + (-2)\}y^2 + 3 \cdot (-2)$$

$$= y^4 + y^2 - 6$$

$$(4) \text{ (与式)} = 2 \cdot 5(xy)^2 + \{2 \cdot (-4) + 3 \cdot 5\}xy + 3 \cdot (-4)$$

$$= 10x^2y^2 + 7xy - 12$$

$$(5) \text{ (与式)} = \{(a^2+2a) + 2\} \{(a^2+2a) - 2\}$$

$$= (a^2+2a)^2 - 2^2$$

$$= (a^2)^2 + 2 \cdot a^2 \cdot 2a + (2a)^2 - 4$$

$$= a^4 + 4a^3 + 4a^2 - 4$$

$$(6) \text{ (与式)} = \{(x^2-x) - 1\} \{(x^2-x) - 3\}$$

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

$$+ (-1) \cdot (-3)$$

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

$$= x^4 - 2x^3 + x^2 - 4x^2 + 4x + 3$$

$$= x^4 - 2x^3 - 3x^2 + 4x + 3$$

$$20 \text{ (1) (与式)} = 2x^3 + 2x^2 + 10x + 4 - 16x - 4x^2$$

$$- 5x^2 + 4x - 3x^3$$

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

$$+ (10-16+4)x + 4$$

$$= -x^3 - 7x^2 - 2x + 4$$

$$(2) \text{ (与式)} = 2x(x-y+3) + 3y(x-y+3)$$

$$+ (x-y+3)$$

$$= 2x^2 - 2xy + 6x + 3xy - 3y^2 + 9y$$

$$+ x - y + 3$$

$$= 2x^2 + 7x + xy - 3y^2 + 8y + 3$$

$$(3) \text{ (与式)} = 3x(x^2+5-3x) - 2x^2(x^2+5-3x)$$

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

$$= 3x^3 + 15x - 9x^2 - 2x^4 - 10x^2 + 6x^3$$

$$- 4x^2 - 20 + 12x$$

$$= -2x^4 + 9x^3 - 23x^2 + 27x - 20$$

$$21 \text{ (1) (与式)} = \{2x + (a-1)\}^2$$

$$= (2x)^2 + 2 \cdot 2x \cdot (a-1) + (a-1)^2$$

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

$$(2) \text{ (与式)} = (ax-2a-2) \cdot 3 + (ax-2a-2) \cdot (-x)$$

$$= 3ax - 6a - 6 - ax^2 + 2ax + 2x$$

$$= -ax^2 + (5a+2)x - (6a+6)$$

22 x^3 の項は

$$x^2 \times 3x + x \times (-x^2) = 3x^3 - x^3$$

$$= 2x^3$$

よって、 x^3 の係数は 2

$$23 \text{ (1) (与式)} = (a^2 - 2bc)(3a^2 + bc)$$

$$= 1 \cdot 3(a^2)^2 + \{1 \cdot bc + (-2bc) \cdot 3\}a^2$$

$$+ (-2bc) \cdot bc$$

$$= 3a^4 - 5a^2bc - 2b^2c^2$$

$$(2) \text{ (与式)} = \{(m^2 - 2m) - 1\}^2$$

$$= (m^2 - 2m)^2 - 2 \cdot (m^2 - 2m) \cdot 1 + 1^2$$

$$= (m^2)^2 - 2 \cdot m^2 \cdot 2m + (2m)^2$$

$$- 2m^2 + 4m + 1$$

$$= m^4 - 4m^3 + 4m^2 - 2m^2 + 4m + 1$$

$$= m^4 - 4m^3 + 2m^2 + 4m + 1$$

参考 $(a+b+c)^2 = a^2 + b^2 + c^2$

$$+ 2ab + 2bc + 2ca$$

を公式として利用すると

$$\text{(与式)} = (m^2)^2 + (-2m)^2 + (-1)^2 + 2 \cdot m^2 \cdot (-2m)$$

$$+ 2 \cdot (-2m) \cdot (-1) + 2 \cdot (-1) \cdot m^2$$

$$= m^4 + 4m^2 + 1 - 4m^3 + 4m - 2m^2$$

$$= m^4 - 4m^3 + 2m^2 + 4m + 1$$

$$\begin{aligned}
 (3) \quad (\text{与式}) &= \{(x-y)(x+y)\}^2 \times (x^2+y^2)^2 \\
 &= (x^2-y^2)^2(x^2+y^2)^2 \\
 &= \{(x^2-y^2)(x^2+y^2)\}^2 \\
 &= \{(x^2)^2 - (y^2)^2\}^2 = (x^4-y^4)^2 \\
 &= (x^4)^2 - 2 \cdot x^4 \cdot y^4 + (y^4)^2 \\
 &= x^8 - 2x^4y^4 + y^8
 \end{aligned}$$

$$\begin{aligned}
 (4) \quad (\text{与式}) &= \{(a-c) + (b-d)\} \{(a-c) - (b-d)\} \\
 &= (a-c)^2 - (b-d)^2 \\
 &= a^2 - 2ac + c^2 - (b^2 - 2bd + d^2) \\
 &= a^2 - b^2 + c^2 - d^2 - 2ac + 2bd
 \end{aligned}$$

$$\begin{aligned}
 (5) \quad (\text{与式}) &= \{(x^2+y^2) + xy\} \{(x^2+y^2) - xy\} \\
 &= (x^2+y^2)^2 - (xy)^2 \\
 &= \{(x^2)^2 + 2 \cdot x^2 \cdot y^2 + (y^2)^2\} - x^2y^2 \\
 &= (x^4 + 2x^2y^2 + y^4) - x^2y^2 \\
 &= x^4 + x^2y^2 + y^4
 \end{aligned}$$

$$\begin{aligned}
 (6) \quad (\text{与式}) &= (k+2)(k-1) \times (k^2-k+2) \\
 &= (k^2+k-2)(k^2-k+2) \\
 &= \{k^2 + (k-2)\} \{k^2 - (k-2)\} \\
 &= (k^2)^2 - (k-2)^2 = k^4 - (k^2 - 4k + 4) \\
 &= k^4 - k^2 + 4k - 4
 \end{aligned}$$

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

$$\begin{aligned}
 (8) \quad (\text{与式}) &= \{2(a-b) + c\} \{(a-b) - c\} \\
 &= 2 \cdot 1 \cdot (a-b)^2 + \{2 \cdot (-c) + c \cdot 1\} (a-b) \\
 &\quad + c \cdot (-c) \\
 &= 2(a^2 - 2ab + b^2) - c(a-b) - c^2 \\
 &= 2a^2 - 4ab + 2b^2 - ac + bc - c^2 \\
 &= 2a^2 + 2b^2 - c^2 - 4ab + bc - ca
 \end{aligned}$$

$$\begin{aligned}
 24 \quad (1) \quad (\text{与式}) &= x(x+3) \times (x+1)(x+2) \\
 &= (x^2+3x)(x^2+3x+2) \\
 &= (x^2+3x)\{(x^2+3x)+2\} \\
 &= (x^2+3x)^2 + 2(x^2+3x) \\
 &= x^4 + 6x^3 + 9x^2 + 2x^2 + 6x \\
 &= x^4 + 6x^3 + 11x^2 + 6x
 \end{aligned}$$

$$\begin{aligned}
 (2) \quad (\text{与式}) &= (x+1)(x-4) \times (x-1)(x-2) \\
 &= (x^2-3x-4)(x^2-3x+2) \\
 &= \{(x^2-3x)-4\} \{(x^2-3x)+2\} \\
 &= (x^2-3x)^2 - 2(x^2-3x) - 8 \\
 &= x^4 - 6x^3 + 9x^2 - 2x^2 + 6x - 8 \\
 &= x^4 - 6x^3 + 7x^2 + 6x - 8
 \end{aligned}$$

$$\begin{aligned}
 (3) \quad (\text{与式}) &= (x+2)(x-2) \times (x+5)(x-5) \\
 &= (x^2-4)(x^2-25) \\
 &= (x^2)^2 - 29x^2 + 100 \\
 &= x^4 - 29x^2 + 100
 \end{aligned}$$

$$25 \quad (1) \quad (\text{与式}) = b \cdot a - b \cdot 3c = b(a-3c)$$

$$(2) \quad (\text{与式}) = 3ab \cdot 2a + 3ab \cdot b = 3ab(2a+b)$$

$$(3) \quad (\text{与式}) = 2x^2 \cdot x + 2x^2 \cdot y - 2x^2 \cdot 3 = 2x^2(x+y-3)$$

$$(4) \quad (\text{与式}) = 4xy \cdot y - 4xy \cdot 3x + 4xy \cdot 2 = 4xy(y-3x+2)$$

$$26 \quad (1) \quad (\text{与式}) = (a-1)(x-1)$$

$$(2) \quad (\text{与式}) = (x+1)(x+1) = (x+1)^2$$

$$(3) \quad (\text{与式}) = a(x-y) + 2(x-y) = (x-y)(a+2)$$

$$(4) \quad (\text{与式}) = 2c(a-3b) - (a-3b)d = (a-3b)(2c-d)$$

$$27 \quad (1) \quad (\text{与式}) = x^2 + 2 \cdot x \cdot 3 + 3^2 = (x+3)^2$$

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

$$(3) \quad (\text{与式}) = 2^2 - 2 \cdot 2 \cdot a + a^2 = (2-a)^2 = (a-2)^2$$

$$(4) \quad (\text{与式}) = x^2 + 2 \cdot x \cdot 2y + (2y)^2 = (x+2y)^2$$

$$(5) \quad (\text{与式}) = (3x)^2 + 2 \cdot 3x \cdot 2y + (2y)^2 = (3x+2y)^2$$

$$(6) \quad (\text{与式}) = a^2 - 2 \cdot a \cdot 5b + (5b)^2 = (a-5b)^2$$

$$(7) \quad (\text{与式}) = (4x)^2 - 2 \cdot 4x \cdot 3y + (3y)^2 = (4x-3y)^2$$

$$(8) \quad (\text{与式}) = x^2 - 9^2 = (x+9)(x-9)$$

$$(9) \quad (\text{与式}) = (3x)^2 - 4^2 = (3x+4)(3x-4)$$

$$(10) \quad (\text{与式}) = (2x)^2 - (5y)^2 = (2x+5y)(2x-5y)$$

$$(11) \quad (\text{与式}) = (8a)^2 - b^2 = (8a+b)(8a-b)$$

$$(12) \quad (\text{与式}) = (6xy)^2 - 7^2 = (6xy+7)(6xy-7)$$

$$28 \quad (1) \quad (\text{与式}) = x^2 + (3+4)x + 3 \cdot 4 = (x+3)(x+4)$$

(2) (与式) $= x^2 + (-5-7)x + (-5) \cdot (-7)$

$$= (x-5)(x-7)$$

(3) (与式) $= a^2 + (-2+9)a + (-2) \cdot 9$

$$= (a-2)(a+9)$$

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

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

(5) (与式) $= y^2 + (-1-8)y + (-1) \cdot (-8)$

$$= (y-1)(y-8)$$

(6) (与式) $= y^2 + (3-9)y + 3 \cdot (-9)$

$$= (y+3)(y-9)$$

(7) (与式) $= t^2 + (2+8)t + 2 \cdot 8$

$$= (t+2)(t+8)$$

(8) (与式) $= x^2 + (-5-6)x + (-5) \cdot (-6)$

$$= (x-5)(x-6)$$

(9) (与式) $= y^2 + (-4+11)y + (-4) \cdot 11$

$$= (y-4)(y+11)$$

29 (1) (与式) $= x^2 + (3y+5y)x + 3y \cdot 5y$

$$= (x+3y)(x+5y)$$

(2) (与式) $= x^2 + (-y-8y)x + (-y) \cdot (-8y)$

$$= (x-y)(x-8y)$$

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

$$= (x+4y)(x-6y)$$

(4) (与式) $= x^2 + (2a+10a)x + 2a \cdot 10a$

$$= (x+2a)(x+10a)$$

(5) (与式) $= x^2 + (4a-9a)x + 4a \cdot (-9a)$

$$= (x+4a)(x-9a)$$

(6) (与式) $= x^2 + (-4a+12a)x + (-4a) \cdot 12a$

$$= (x-4a)(x+12a)$$

(7) (与式) $= a^2 + (2b+9b)a + 2b \cdot 9b$

$$= (a+2b)(a+9b)$$

(8) (与式) $= a^2 + (-4b+5b)a + (-4b) \cdot 5b$

$$= (a-4b)(a+5b)$$

(9) (与式) $= a^2 + (-6b-7b)a + (-6b) \cdot (-7b)$

$$= (a-6b)(a-7b)$$

30 (1) $3x^2 + 5x + 2$

$$= (x+1)(3x+2)$$

$$\begin{array}{r} 1 \times 1 \rightarrow 3 \\ 3 \times 2 \rightarrow 2 \\ \hline 3 \quad 2 \quad 5 \end{array}$$

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

$$= (x+3)(2x+1)$$

$$\begin{array}{r} 1 \times 3 \rightarrow 6 \\ 2 \times 1 \rightarrow 1 \\ \hline 2 \quad 3 \quad 7 \end{array}$$

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

$$= (x-2)(3x-1)$$

$$\begin{array}{r} 3 \times -2 \rightarrow -6 \\ 3 \times -1 \rightarrow -1 \\ \hline 3 \quad 2 \quad -7 \end{array}$$

(4) $6x^2 + x - 1$

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

$$\begin{array}{r} 2 \times 1 \rightarrow 3 \\ 3 \times -1 \rightarrow -2 \\ \hline 6 \quad -1 \quad 1 \end{array}$$

(5) $8y^2 + 14y - 15$

$$= (2y+5)(4y-3)$$

$$\begin{array}{r} 2 \times 5 \rightarrow 20 \\ 4 \times -3 \rightarrow -6 \\ \hline 8 \quad -15 \quad 14 \end{array}$$

(6) $6y^2 - 5y - 4$

$$= (2y+1)(3y-4)$$

$$\begin{array}{r} 2 \times 1 \rightarrow 3 \\ 3 \times -4 \rightarrow -8 \\ \hline 6 \quad -4 \quad -5 \end{array}$$

(7) $2x^2 - 7ax + 6a^2$

$$= (x-2a)(2x-3a)$$

$$\begin{array}{r} 1 \times -2a \rightarrow -4a \\ 2 \times -3a \rightarrow -3a \\ \hline 2 \quad 6a^2 \quad -7a \end{array}$$

(8) $3x^2 - 11ax - 4a^2$

$$= (x-4a)(3x+a)$$

$$\begin{array}{r} 1 \times -4a \rightarrow -12a \\ 3 \times a \rightarrow a \\ \hline 3 \quad -4a^2 \quad -11a \end{array}$$

(9) $5x^2 + 7xy - 6y^2$

$$= (x+2y)(5x-3y)$$

$$\begin{array}{r} 1 \times 2y \rightarrow 10y \\ 5 \times -3y \rightarrow -3y \\ \hline 5 \quad -6y^2 \quad 7y \end{array}$$

(10) $12x^2 - 7xy - 12y^2$

$$= (3x-4y)(4x+3y)$$

$$\begin{array}{r} 3 \times -4y \rightarrow -16y \\ 4 \times 3y \rightarrow 9y \\ \hline 12 \quad -12y^2 \quad -7y \end{array}$$

(11) $6a^2 + 17ab + 12b^2$

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

$$\begin{array}{r} 2 \times 3b \rightarrow 9b \\ 3 \times 4b \rightarrow 8b \\ \hline 6 \quad 12b^2 \quad 17b \end{array}$$

(12) $12a^2 - 23ab + 10b^2$

$$= (3a-2b)(4a-5b)$$

$$\begin{array}{r} 3 \times -2b \rightarrow -8b \\ 4 \times -5b \rightarrow -15b \\ \hline 12 \quad 10b^2 \quad -23b \end{array}$$

31 (1) $x+y=A$ とおく。

(与式) $= A^2 - 6A + 8 = (A-2)(A-4)$

$$= [(x+y)-2][(x+y)-4]$$

$$= (x+y-2)(x+y-4)$$

(2) $a-b=A$ とおく。

(与式) $= 2A^2 - 3A + 1 = (A-1)(2A-1)$

$$= [(a-b)-1][2(a-b)-1]$$

$$= (a-b-1)(2a-2b-1)$$

$$\begin{array}{r} 1 \times -1 \rightarrow -2 \\ 2 \times -1 \rightarrow -1 \\ \hline 2 \quad 1 \quad -3 \end{array}$$

(3) $x-y-1=A$ とおく。

(与式) $= A^2 - 6A + 9 = (A-3)^2$

$$= [(x-y-1)-3]^2$$

$$= (x-y-4)^2$$

(4) $a+b+1=A$ とおく。

$$\begin{aligned} \text{(与式)} &= 4A^2 - 5A - 6 = (A-2)(4A+3) \\ &= (a+b+1) - 2 \{4(a+b+1) + 3\} \\ &= (a+b-1)(4a+4b+7) \\ &\quad \begin{array}{r} 1 \times -2 \rightarrow -8 \\ 4 \times 3 \rightarrow 12 \\ \hline 4 \quad -6 \quad -5 \end{array} \end{aligned}$$

32 (1) $x^2=A$ とおく。

$$\begin{aligned} \text{(与式)} &= A^2 - 7A - 18 = (A+2)(A-9) \\ &= (x^2+2)(x^2-9) = (x^2+2)(x+3)(x-3) \end{aligned}$$

(2) $x^2=A$ とおく。

$$\begin{aligned} \text{(与式)} &= A^2 - 256 = (A+16)(A-16) \\ &= (x^2+16)(x^2-16) = (x^2+16)(x+4)(x-4) \end{aligned}$$

(3) $x^2=A$ とおく。

$$\begin{aligned} \text{(与式)} &= 81A^2 - 18A + 1 = (9A-1)^2 \\ &= (9x^2-1)^2 = \{(3x+1)(3x-1)\}^2 \\ &= (3x+1)^2(3x-1)^2 \end{aligned}$$

(4) $x^2=A$ とおく。

$$\begin{aligned} \text{(与式)} &= 4A^2 - 13A + 9 = (A-1)(4A-9) \\ &= (x^2-1)(4x^2-9) \\ &= (x+1)(x-1)(2x+3)(2x-3) \end{aligned}$$

(5) $x^2+3x=A$ とおく。

$$\begin{aligned} \text{(与式)} &= A^2 - 6A - 16 = (A+2)(A-8) \\ &= \{(x^2+3x)+2\} \{(x^2+3x)-8\} \\ &= (x^2+3x+2)(x^2+3x-8) \\ &= (x+1)(x+2)(x^2+3x-8) \end{aligned}$$

(6) $x^2-x=A$ とおく。

$$\begin{aligned} \text{(与式)} &= A^2 - 22A + 40 = (A-2)(A-20) \\ &= \{(x^2-x)-2\} \{(x^2-x)-20\} \\ &= (x^2-x-2)(x^2-x-20) \\ &= (x+1)(x-2)(x+4)(x-5) \end{aligned}$$

33 (1) y について整理すると

$$\begin{aligned} \text{(与式)} &= (2x-6)y + x^2 - 5x + 6 \\ &= 2(x-3)y + (x-2)(x-3) \\ &= (x-3)\{2y+(x-2)\} = (x-3)(x+2y-2) \end{aligned}$$

(2) a について整理すると

$$\begin{aligned} \text{(与式)} &= (2x-8)a + x^2 - 16 \\ &= 2(x-4)a + (x+4)(x-4) \\ &= (x-4)\{2a+(x+4)\} = (x-4)(x+2a+4) \end{aligned}$$

(3) y について整理すると

$$\begin{aligned} \text{(与式)} &= (2x-4)y - (x^2-4) \\ &= 2(x-2)y - (x+2)(x-2) \\ &= (x-2)\{2y-(x+2)\} \\ &= (x-2)\{-(x-2y+2)\} \\ &= -(x-2)(x-2y+2) \end{aligned}$$

(4) b について整理すると

$$\begin{aligned} \text{(与式)} &= (a^2-1)b + (a-1) \\ &= (a+1)(a-1)b + (a-1) \\ &= (a-1)\{(a+1)b+1\} \\ &= (a-1)(ab+b+1) \end{aligned}$$

(5) c について整理すると

$$\begin{aligned} \text{(与式)} &= (b-a)c + (a^2-2ab+b^2) \\ &= -(a-b)c + (a-b)^2 \\ &= (a-b)\{-c+(a-b)\} \\ &= (a-b)(a-b-c) \end{aligned}$$

(6) z について整理すると

$$\begin{aligned} \text{(与式)} &= (-4x^2+y^2)z + (4x^2y-y^3) \\ &= -(4x^2-y^2)z + (4x^2-y^2)y \\ &= (4x^2-y^2)(-z+y) \\ &= (2x+y)(2x-y)(y-z) \end{aligned}$$

34 (1) (与式) $= \{x+(2y-1)\} \{x+(3y+2)\}$

$$\begin{aligned} &= (x+2y-1)(x+3y+2) \\ &\quad \begin{array}{r} 1 \times 2y-1 \rightarrow 2y-1 \\ 1 \times 3y+2 \rightarrow 3y+2 \\ \hline 1 \quad (2y-1)(3y+2) \quad 5y+1 \end{array} \end{aligned}$$

(2) (与式) $= x^2 + (-a-5)x - (2a^2 - a - 6)$

$$\begin{aligned} &= x^2 + (-a-5)x - (a-2)(2a+3) \\ &= \{x+(a-2)\} \{x-(2a+3)\} \\ &= (x+a-2)(x-2a-3) \\ &\quad \begin{array}{r} 1 \times a-2 \rightarrow a-2 \\ 1 \times -(2a+3) \rightarrow -2a-3 \\ \hline 1 \quad -(a-2)(2a+3) \quad -a-5 \end{array} \end{aligned}$$

(3) x について整理すると

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

$$\begin{array}{r} 1 \times y-1 \rightarrow 2y-2 \\ 2 \times -(y+1) \rightarrow -2y-2 \\ \hline 2 \quad -(y+1)(y-1) \quad y-3 \end{array}$$

(4) x について整理すると

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

$$\begin{array}{r} 2 \times -(y+4) \rightarrow -2y-8 \\ 3 \times -(2y-3) \rightarrow -6y+9 \\ \hline 6 \quad (y+4)(2y-3) \quad -7y-6 \end{array}$$

35 (1) (与式)

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

$$\begin{aligned}
 &= (b+c)a^2 + (b+c)^2a + bc(b+c) \\
 &= (b+c)[a^2 + (b+c)a + bc] \\
 &= (b+c)(a+b)(a+c) = (a+b)(b+c)(c+a)
 \end{aligned}$$

(2) (与式)

$$\begin{aligned}
 &= (b+c)a^2 + (b^2+3bc+c^2)a + (b^2c+bc^2) \\
 &= (b+c)a^2 + (b^2+3bc+c^2)a + bc(b+c) \\
 &= 1 \cdot (b+c)a^2 + [1 \cdot bc + (b+c)^2]a + (b+c) \cdot bc \\
 &= [a+(b+c)](b+c)a + bc] = (a+b+c)(ab+bc+ca) \\
 &\quad \begin{array}{ccc} 1 & \times & b+c \\ b+c & & bc \end{array} \begin{array}{l} \longrightarrow b^2+2bc+c^2 \\ \longrightarrow bc \end{array} \\
 &\quad \frac{1}{b+c} \times \frac{b+c}{bc(b+c)} \longrightarrow \frac{b^2+2bc+c^2}{b^2+3bc+c^2}
 \end{aligned}$$

36 (1) (与式) $= a^3 - 3 \cdot a^2 \cdot 2 + 3 \cdot a \cdot 2^2 - 2^3$
 $= a^3 - 6a^2 + 12a - 8$

(2) (与式) $= (3x)^3 + 3 \cdot (3x)^2 \cdot 1 + 3 \cdot 3x \cdot 1^2 + 1^3$
 $= 27x^3 + 27x^2 + 9x + 1$

(3) (与式) $= (2x)^3 + 3 \cdot (2x)^2 \cdot 3y + 3 \cdot 2x \cdot (3y)^2 + (3y)^3$
 $= 8x^3 + 36x^2y + 54xy^2 + 27y^3$

(4) (与式) $= (4a)^3 - 3 \cdot (4a)^2 \cdot 3b + 3 \cdot 4a \cdot (3b)^2 - (3b)^3$
 $= 64a^3 - 144a^2b + 108ab^2 - 27b^3$

(5) (与式) $= (x+3)(x^2-x \cdot 3+3^2) = x^3+3^3 = x^3+27$

(6) (与式) $= (a-1)(a^2+a \cdot 1+1^2) = a^3-1^3 = a^3-1$

(7) (与式) $= (2a+b)[(2a)^2-2a \cdot b+b^2] = (2a)^3+b^3$
 $= 8a^3+b^3$

(8) (与式) $= (3x-5y)[(3x)^2+3x \cdot 5y+(5y)^2]$
 $= (3x)^3-(5y)^3 = 27x^3-125y^3$

37 (1) (与式) $= x^3-4^3 = (x-4)(x^2+x \cdot 4+4^2)$
 $= (x-4)(x^2+4x+16)$

(2) (与式) $= (2a)^3+3^3 = (2a+3)[(2a)^2-2a \cdot 3+3^2]$
 $= (2a+3)(4a^2-6a+9)$

(3) (与式) $= (4a)^3-b^3 = (4a-b)[(4a)^2+4a \cdot b+b^2]$
 $= (4a-b)(16a^2+4ab+b^2)$

(4) (与式) $= (5x)^3+(2y)^3$
 $= (5x+2y)[(5x)^2-5x \cdot 2y+(2y)^2]$
 $= (5x+2y)(25x^2-10xy+4y^2)$

38 (1) (与式)

$$\begin{aligned}
 &= (x-1)(x-7) \times (x-3)(x-5) + 15 \\
 &= (x^2-8x+7)(x^2-8x+15) + 15 \\
 &= [(x^2-8x)+7][(x^2-8x)+15] + 15 \\
 &= [(x^2-8x)^2+22(x^2-8x)+105] + 15 \\
 &= (x^2-8x)^2+22(x^2-8x)+120 \\
 &= [(x^2-8x)+12][(x^2-8x)+10] \\
 &= (x^2-8x+12)(x^2-8x+10) \\
 &= (x-2)(x-6)(x^2-8x+10)
 \end{aligned}$$

(2) (与式) $= (x-1)(x+3) \times (x-2)(x+4) + 4$
 $= (x^2+2x-3)(x^2+2x-8) + 4$
 $= [(x^2+2x)-3][(x^2+2x)-8] + 4$
 $= [(x^2+2x)^2-11(x^2+2x)+24] + 4$
 $= (x^2+2x)^2-11(x^2+2x)+28$
 $= [(x^2+2x)-4][(x^2+2x)-7]$
 $= (x^2+2x-4)(x^2+2x-7)$

39 (1) (与式) $= 2xy(8x^3+y^3)$
 $= 2xy(2x)^3+y^3]$
 $= 2xy(2x+y)[(2x)^2-2x \cdot y+y^2]$
 $= 2xy(2x+y)(4x^2-2xy+y^2)$

(2) (与式)

$$\begin{aligned}
 &= (x^3)^2-(y^3)^2 = (x^3+y^3)(x^3-y^3) \\
 &= (x+y)(x^2-xy+y^2)(x-y)(x^2+xy+y^2) \\
 &= (x+y)(x-y)(x^2+xy+y^2)(x^2-xy+y^2) \\
 &\quad \text{【别解】 (与式)} \\
 &\quad = (x^3)^3-(y^3)^3 \\
 &\quad = (x^2-y^2)(x^4+x^2y^2+y^4) \\
 &\quad = (x^2-y^2)[(x^4+2x^2y^2+y^4)-x^2y^2] \\
 &\quad = (x^2-y^2)[(x^2+y^2)^2-(xy)^2] \\
 &\quad = (x^2-y^2)[(x^2+y^2)+xy][(x^2+y^2)-xy] \\
 &\quad = (x+y)(x-y)(x^2+xy+y^2)(x^2-xy+y^2)
 \end{aligned}$$

(3) (与式)

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

40 (1) $\frac{2}{5} = 0.4$

(2) $\frac{5}{9} = 0.555 \cdots = 0.\dot{5}$

(3) $\frac{2}{11} = 0.181818 \cdots = 0.1\dot{8}$

(4) $\frac{7}{8} = 0.875$

(5) $\frac{4}{3} = 1.333 \cdots = 1.\dot{3}$

(6) $\frac{19}{6} = 3.1666 \cdots = 3.1\dot{6}$