

文字と式（多項式の計算）

1 解答 (1)  $3x - 2y$  (2)  $7a - 6b$

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

$$\begin{aligned} (2) \quad (5a - 2b) + (2a - 4b) &= 5a - 2b + 2a - 4b \\ &= 5a + 2a - 2b - 4b \\ &= 7a - 6b \end{aligned}$$

2 解答 (1)  $10x + 7y$  (2)  $-x + y$  (3)  $7a - 7b$  (4)  $4a + 2b$   
(5)  $5x^2 - xy$  (6)  $ab + 3bc + ca$

$$\begin{aligned} (1) \quad (3x + y) + (7x + 6y) &= 3x + y + 7x + 6y \\ &= 3x + 7x + y + 6y \\ &= 10x + 7y \end{aligned}$$

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

$$\begin{aligned} (3) \quad (3a - 2b) + (4a - 5b) &= 3a - 2b + 4a - 5b \\ &= 3a + 4a - 2b - 5b \\ &= 7a - 7b \end{aligned}$$

$$\begin{aligned} (4) \quad 8a + (-4a + 2b) &= 8a - 4a + 2b \\ &= 4a + 2b \end{aligned}$$

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

$$\begin{aligned} (6) \quad (-2ab + 4bc - ca) + (3ab - bc + 2ca) &= -2ab + 4bc - ca + 3ab - bc + 2ca \\ &= -2ab + 3ab + 4bc - bc - ca + 2ca \\ &= ab + 3bc + ca \end{aligned}$$

3 解答 (1)  $-2x + y$  (2)  $2a + 3b$

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

$$(2) \quad (7a - 3b) - (5a - 6b) = 7a - 3b - 5a + 6b$$

$$\begin{aligned} &= 7a - 5a - 3b + 6b \\ &= 2a + 3b \end{aligned}$$

4 解答 (1)  $3x + 3y$  (2)  $3a - 3b$  (3)  $2x + 11y$  (4)  $-a - 6b$   
(5)  $x^2 - 4xy - 3y^2$  (6)  $-2ab + bc$

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

$$\begin{aligned} (2) \quad (4a - 7b) - (a - 4b) &= 4a - 7b - a + 4b \\ &= 4a - a - 7b + 4b \\ &= 3a - 3b \end{aligned}$$

$$\begin{aligned} (3) \quad (5x + 4y) - (3x - 7y) &= 5x + 4y - 3x + 7y \\ &= 5x - 3x + 4y + 7y \\ &= 2x + 11y \end{aligned}$$

$$\begin{aligned} (4) \quad (-4a - 7b) - (-b - 3a) &= -4a - 7b + b + 3a \\ &= -4a + 3a - 7b + b \\ &= -a - 6b \end{aligned}$$

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

$$\begin{aligned} (6) \quad (5ab - bc + 3ca) - (7ab + 3ca - 2bc) &= 5ab - bc + 3ca - 7ab - 3ca + 2bc \\ &= 5ab - 7ab - bc + 2bc + 3ca - 3ca \\ &= -2ab + bc \end{aligned}$$

5 解答 (1)  $6x - 2y$  (2)  $-5a - 10b$  (3)  $6x - 3y + 15$

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

$$\begin{aligned} (2) \quad -5(a + 2b) &= (-5) \times a + (-5) \times 2b \\ &= -5a - 10b \end{aligned}$$

$$\begin{aligned} (3) \quad 3(2x - y + 5) &= 3 \times 2x + 3 \times (-y) + 3 \times 5 \\ &= 6x - 3y + 15 \end{aligned}$$

6 解答 (1)  $14x - 35y$  (2)  $-24x + 3y$  (3)  $10a - 5b + 5$  (4)  $2x - y$

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

(1)  $7(2x - 5y) = 7 \times 2x + 7 \times (-5y)$   
 $= 14x - 35y$

(2)  $(8x - y) \times (-3) = 8x \times (-3) + (-y) \times (-3)$   
 $= -24x + 3y$

(3)  $5(2a - b + 1) = 5 \times 2a + 5 \times (-b) + 5 \times 1$   
 $= 10a - 5b + 5$

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

(5)  $(4x^2 - 2x + 10) \times \left(-\frac{1}{2}\right) = 4x^2 \times \left(-\frac{1}{2}\right) + (-2x) \times \left(-\frac{1}{2}\right) + 10 \times \left(-\frac{1}{2}\right)$   
 $= -2x^2 + x - 5$

7 解答 (1)  $2x + 3y$  (2)  $-3a + 2b - 1$

(1)  $(4x + 6y) \div 2 = (4x + 6y) \times \frac{1}{2}$   
 $= 4x \times \frac{1}{2} + 6y \times \frac{1}{2}$   
 $= 2x + 3y$

(2)  $(15a - 10b + 5) \div (-5) = (15a - 10b + 5) \times \left(-\frac{1}{5}\right)$   
 $= 15a \times \left(-\frac{1}{5}\right) - 10b \times \left(-\frac{1}{5}\right) + 5 \times \left(-\frac{1}{5}\right)$   
 $= -3a + 2b - 1$

8 解答 (1)  $3x - y$  (2)  $-3a + 5b$  (3)  $x + 3y - 4$  (4)  $-2x^2 + x + 4$

(5)  $2a - \frac{3}{2}b$

(1)  $(12x - 4y) \div 4 = (12x - 4y) \times \frac{1}{4} = 3x - y$

(2)  $(9a - 15b) \div (-3) = (9a - 15b) \times \left(-\frac{1}{3}\right) = -3a + 5b$

(3)  $(2x + 6y - 8) \div 2 = (2x + 6y - 8) \times \frac{1}{2} = x + 3y - 4$

(4)  $(10x^2 - 5x - 20) \div (-5) = (10x^2 - 5x - 20) \times \left(-\frac{1}{5}\right) = -2x^2 + x + 4$

(5)  $\left(\frac{6}{7}a - \frac{9}{14}b\right) \div \frac{3}{7} = \left(\frac{6}{7}a - \frac{9}{14}b\right) \times \frac{7}{3} = 2a - \frac{3}{2}b$

9 解答 (1)  $3a + b$  (2)  $3p + 5q$  (3)  $2x - 3y$  (4)  $-3m + 2n$

(5)  $2a^2 + 3a$  (6)  $2x^2 + 3y^2$  (7)  $2a - 5b + 3$  (8)  $-6x - 9y + 1$

(9)  $8a^2 - 5a - 11$

(1)  $(12a + 4b) \div 4 = (12a + 4b) \times \frac{1}{4}$   
 $= 3a + b$

(2)  $(6p + 10q) \div 2 = (6p + 10q) \times \frac{1}{2}$   
 $= 3p + 5q$

(3)  $(12x - 18y) \div 6 = (12x - 18y) \times \frac{1}{6}$   
 $= 2x - 3y$

(4)  $(21m - 14n) \div (-7) = (21m - 14n) \times \left(-\frac{1}{7}\right)$   
 $= -3m + 2n$

(5)  $(-18a^2 - 27a) \div (-9) = (-18a^2 - 27a) \times \left(-\frac{1}{9}\right)$   
 $= 2a^2 + 3a$

(6)  $(32x^2 + 48y^2) \div 16 = (32x^2 + 48y^2) \times \frac{1}{16}$   
 $= 2x^2 + 3y^2$

(7)  $(6a - 15b + 9) \div 3 = (6a - 15b + 9) \times \frac{1}{3}$   
 $= 2a - 5b + 3$

(8)  $(42x + 63y - 7) \div (-7) = (42x + 63y - 7) \times \left(-\frac{1}{7}\right)$   
 $= -6x - 9y + 1$

(9)  $(64a^2 - 40a - 88) \div 8 = (64a^2 - 40a - 88) \times \frac{1}{8}$   
 $= 8a^2 - 5a - 11$

- 10 解答 (1)  $-5x+3y$  (2)  $10a^2+6a-2$  (3)  $6m-9n+3$  (4)  $6x^2+x-3$   
 (5)  $2a^2+7a-8$  (6)  $-m-2n+9$  (7)  $9x^2-x-6$

$$(1) (20x-12y) \times \left(-\frac{1}{4}\right) = 20x \times \left(-\frac{1}{4}\right) - 12y \times \left(-\frac{1}{4}\right) \\ = -5x + 3y$$

$$(2) 2(5a^2+3a-1) = 2 \times 5a^2 + 2 \times 3a + 2 \times (-1) \\ = 10a^2 + 6a - 2$$

$$(3) (4m-6n+2) \div \frac{2}{3} = (4m-6n+2) \times \frac{3}{2} \\ = 4m \times \frac{3}{2} - 6n \times \frac{3}{2} + 2 \times \frac{3}{2} \\ = 6m - 9n + 3$$

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

$$(5) (3a^2+7a-9) - (a^2-1) = 3a^2+7a-9-a^2+1 \\ = 3a^2-a^2+7a-9+1 \\ = 2a^2+7a-8$$

$$(6) (2m+6n+4) - (3m+8n-5) = 2m+6n+4-3m-8n+5 \\ = 2m-3m+6n-8n+4+5 \\ = -m-2n+9$$

$$(7) (6x^2-2x-5) + (3x^2+x-1) = 6x^2-2x-5+3x^2+x-1 \\ = 6x^2+3x^2-2x+x-5-1 \\ = 9x^2-x-6$$

- 11 解答 (1)  $6x-5y$  (2)  $8a-2b$  (3)  $-a+b$  (4)  $-6x-3y$

$$(1) (3x+y) + 3(x-2y) = 3x+y+3x-6y \\ = 3x+3x+y-6y \\ = 6x-5y$$

$$(2) 4(a-2b) + 2(2a+3b) = 4a-8b+4a+6b \\ = 4a+4a-8b+6b \\ = 8a-2b$$

$$(3) 4(2a+b) - 3(3a+b) = 8a+4b-9a-3b \\ = 8a-9a+4b-3b$$

$$= -a + b$$

$$(4) 6(x-2y) - 3(4x-3y) = 6x-12y-12x+9y \\ = 6x-12x-12y+9y \\ = -6x-3y$$

- 12 解答 (1)  $4x-7y$  (2)  $6m+5n$  (3)  $8a-4b+16$   
 (4)  $-9a^2-15a-1$  (5)  $7x-6y-13$  (6)  $3a^2+a+2$

$$(1) 5(2x-5y) - 6(x-3y) = 10x-25y-6x+18y \\ = 10x-6x-25y+18y \\ = 4x-7y$$

$$(2) -8(m+2n) + 7(2m+3n) = -8m-16n+14m+21n \\ = -8m+14m-16n+21n \\ = 6m+5n$$

$$(3) 2(2a+4b) + 4(a-3b+4) = 4a+8b+4a-12b+16 \\ = 4a+4a+8b-12b+16 \\ = 8a-4b+16$$

$$(4) 5(a^2-3a+4) - 7(2a^2+3) = 5a^2-15a+20-14a^2-21 \\ = 5a^2-14a^2-15a+20-21 \\ = -9a^2-15a-1$$

$$(5) 3(x-4y-5) + 2(2x+3y+1) = 3x-12y-15+4x+6y+2 \\ = 3x+4x-12y+6y-15+2 \\ = 7x-6y-13$$

$$(6) 4(2a^2+4a-2) - 5(a^2+3a-2) = 8a^2+16a-8-5a^2-15a+10 \\ = 8a^2-5a^2+16a-15a-8+10 \\ = 3a^2+a+2$$

13 解答 (1)  $\frac{3x+2y}{4}$  (2)  $\frac{7}{6}b$  (3)  $\frac{5x-5y}{6}$

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

$$\begin{aligned} (2) \quad \frac{a+2b}{3} - \frac{2a-3b}{6} &= \frac{2(a+2b)}{6} - \frac{2a-3b}{6} \\ &= \frac{2(a+2b)-(2a-3b)}{6} \\ &= \frac{2a+4b-2a+3b}{6} \\ &= \frac{7}{6}b \end{aligned}$$

$$\begin{aligned} (3) \quad \frac{x-3y}{2} + \frac{x+2y}{3} &= \frac{3(x-3y)}{6} + \frac{2(x+2y)}{6} \\ &= \frac{3(x-3y)+2(x+2y)}{6} \\ &= \frac{3x-9y+2x+4y}{6} \\ &= \frac{5x-5y}{6} \end{aligned}$$

14 解答 (1)  $18x+15y$  (2)  $a+4b$  (3)  $13m+n$  (4)  $14x-3y$   
 (5)  $13a-30b$  (6)  $-18x-2y$  (7)  $8a$  (8)  $9p+36q$   
 (9)  $15x^2+11x-22$  (10)  $34a^2+35ab-24b^2$

$$\begin{aligned} (1) \quad 8x+5(2x+3y) &= 8x+10x+15y \\ &= 18x+15y \end{aligned}$$

$$\begin{aligned} (2) \quad -4(6a-b)+25a &= -24a+4b+25a \\ &= -24a+25a+4b \\ &= a+4b \end{aligned}$$

$$\begin{aligned} (3) \quad 2(9m-3n)+(-5m+7n) &= 18m-6n-5m+7n \\ &= 13m+n \end{aligned}$$

$$= 13m+n$$

$$\begin{aligned} (4) \quad 3(2x+5y)+2(4x-9y) &= 6x+15y+8x-18y \\ &= 6x+8x+15y-18y \\ &= 14x-3y \end{aligned}$$

$$\begin{aligned} (5) \quad 3(a-5b)+5(2a-3b) &= 3a-15b+10a-15b \\ &= 3a+10a-15b-15b \\ &= 13a-30b \end{aligned}$$

$$\begin{aligned} (6) \quad 2(-5x+y)-4(2x+y) &= -10x+2y-8x-4y \\ &= -10x-8x+2y-4y \\ &= -18x-2y \end{aligned}$$

$$\begin{aligned} (7) \quad 5(3a-7b)-7(a-5b) &= 15a-35b-7a+35b \\ &= 15a-7a-35b+35b \\ &= 8a \end{aligned}$$

$$\begin{aligned} (8) \quad -3(p-2q)+6(2p+5q) &= -3p+6q+12p+30q \\ &= -3p+12p+6q+30q \\ &= 9p+36q \end{aligned}$$

$$\begin{aligned} (9) \quad 3(x^2-7x+2)+4(3x^2+8x-7) &= 3x^2-21x+6+12x^2+32x-28 \\ &= 3x^2+12x^2-21x+32x+6-28 \\ &= 15x^2+11x-22 \end{aligned}$$

$$\begin{aligned} (10) \quad 7(4a^2+5ab-2b^2)-2(5b^2-3a^2) &= 28a^2+35ab-14b^2-10b^2+6a^2 \\ &= 28a^2+6a^2+35ab-14b^2-10b^2 \\ &= 34a^2+35ab-24b^2 \end{aligned}$$

15 解答 (1)  $\frac{8x+3y}{8}$  (2)  $\frac{6a-11b}{12}$  (3)  $\frac{-4x+8y}{3}$

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

$$\begin{aligned}(2) \quad \frac{3a-2b}{3} - \frac{2a+b}{4} &= \frac{4(3a-2b)}{12} - \frac{3(2a+b)}{12} \\ &= \frac{4(3a-2b) - 3(2a+b)}{12} \\ &= \frac{12a-8b-6a-3b}{12} \\ &= \frac{6a-11b}{12}\end{aligned}$$

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