

式と計算（単項式と多項式の乗除） 解答と解説

1 解答 (1) $2ab + 3ac$ (2) $3x^2 - 6xy$ (3) $-2x^2 + 10x$ (4) $-12ab - 20b^2$

$$(1) a(2b + 3c) = a \times 2b + a \times 3c \\ = 2ab + 3ac$$

$$(2) (x - 2y) \times 3x = x \times 3x - 2y \times 3x \\ = 3x^2 - 6xy$$

$$(3) -2x(x - 5) = -2x \times x - 2x \times (-5) \\ = -2x^2 + 10x$$

$$(4) (3a + 5b) \times (-4b) = 3a \times (-4b) + 5b \times (-4b) \\ = -12ab - 20b^2$$

2 解答 (1) $3a^2 - 6ab + 15ac$ (2) $4x^2 - 10xy$ (3) $-6a^3 + 4a^2b - 3ab$

$$(1) 3a(a - 2b + 5c) = 3a \times a + 3a \times (-2b) + 3a \times 5c \\ = 3a^2 - 6ab + 15ac$$

$$(2) (6x - 15y) \times \frac{2}{3}x = 6x \times \frac{2}{3}x - 15y \times \frac{2}{3}x \\ = 4x^2 - 10xy$$

$$(3) -\frac{1}{4}a(24a^2 - 16ab + 12b) = -\frac{1}{4}a \times 24a^2 - \frac{1}{4}a \times (-16ab) - \frac{1}{4}a \times 12b \\ = -6a^3 + 4a^2b - 3ab$$

3 解答 (1) $xy + x$ (2) $-8ac + 12bc$ (3) $6x^2 - 3xy - 3x$

$$(1) x(y + 1) = x \times y + x \times 1 \\ = xy + x$$

$$(2) (2a - 3b) \times (-4c) = 2a \times (-4c) - 3b \times (-4c) \\ = -8ac + 12bc$$

$$(3) 3x(2x - y - 1) = 3x \times 2x + 3x \times (-y) + 3x \times (-1) \\ = 6x^2 - 3xy - 3x$$

4 解答 (1) $ab + 2ac$ (2) $6x^2 - 2xy$ (3) $-3x^2 + 3x$ (4) $-20a^2 - 15ab$

(5) $3x^3 - x^2$ (6) $4a^3 - 6a^2$

$$(1) a(b + 2c) = a \times b + a \times 2c \\ = ab + 2ac$$

$$(2) (3x - y) \times 2x = 3x \times 2x - y \times 2x \\ = 6x^2 - 2xy$$

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

$$(4) (4a + 3b) \times (-5a) = 4a \times (-5a) + 3b \times (-5a) \\ = -20a^2 - 15ab$$

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

$$(6) -\frac{2}{3}a(-6a^2 + 9a) = -\frac{2}{3}a \times (-6a^2) - \frac{2}{3}a \times 9a \\ = 4a^3 - 6a^2$$

5 解答 (1) $3ab + 4ac - 2a$ (2) $-2x^2 + 4xy - 6x$ (3) $-6a^2 - 3ab + 9a$

$$(1) a(3b + 4c - 2) = a \times 3b + a \times 4c + a \times (-2) \\ = 3ab + 4ac - 2a$$

$$(2) (x - 2y + 3) \times (-2x) = x \times (-2x) - 2y \times (-2x) + 3 \times (-2x) \\ = -2x^2 + 4xy - 6x$$

$$(3) (8a + 4b - 12) \times \left(-\frac{3}{4}a\right) = 8a \times \left(-\frac{3}{4}a\right) + 4b \times \left(-\frac{3}{4}a\right) - 12 \times \left(-\frac{3}{4}a\right) \\ = -6a^2 - 3ab + 9a$$

6 解答 (1) $4ab - 12a$ (2) $5x^2 + 10x$ (3) $-3ax - 7a$ (4) $2a^2 + 16ab$

(5) $14x^2 - 21xy$ (6) $24ab - 60ac$ (7) $9m - 2n$ (8) $-3ax + 12ay$
(9) $-7ap + 2p^2$

$$(1) 4a(b - 3) = 4ab - 12a$$

$$(2) 5x(x + 2) = 5x^2 + 10x$$

$$(3) -a(3x + 7) = -3ax - 7a$$

$$(4) 2a(a + 8b) = 2a^2 + 16ab$$

$$(5) 7x(2x - 3y) = 14x^2 - 21xy$$

$$(6) 12a(2b - 5c) = 24ab - 60ac$$

$$(7) -(-9m + 2n) = 9m - 2n$$

$$(8) -3a(x - 4y) = -3ax + 12ay$$

$$(9) p(-7a + 2p) = -7ap + 2p^2$$

- 7 **解答** (1) $5ax + 6a$ (2) $21x^2 - 28x$ (3) $20ap - 28a$ (4) $4ax + 3ay$
 (5) $22x^2 - 2xy$ (6) $-25mn + 35n^2$ (7) $-8ax - 7bx$
 (8) $-28ab + 63b^2$ (9) $48ux + 30vx$

- (1) $(5x + 6) \times a = 5ax + 6a$
 (2) $(3x - 4) \times 7x = 21x^2 - 28x$
 (3) $(5p - 7) \times 4a = 20ap - 28a$
 (4) $(4x + 3y) \times a = 4ax + 3ay$
 (5) $(11x - y) \times 2x = 22x^2 - 2xy$
 (6) $(-5m + 7n) \times 5n = -25mn + 35n^2$
 (7) $(8a + 7b) \times (-x) = -8ax - 7bx$
 (8) $(4a - 9b) \times (-7b) = -28ab + 63b^2$
 (9) $(-8u - 5v) \times (-6x) = 48ux + 30vx$

- 8 **解答** (1) $36ax - 45bx + 27x$ (2) $14ab + 35b^2 - 21bc$ (3) $-20x^2 - 5xy + 30xz$
 (4) $-3mx - 7my + mz$ (5) $-35ac + 20bc + 65c^2$ (6) $8px - 2qx - 3rx$
 (7) $-9ac + 6bc - 12c^2$ (8) $-12x^2 + 18xy - 22xz$ (9) $54ab - 21b^2 + 12bc$

- (1) $9x(4a - 5b + 3) = 36ax - 45bx + 27x$
 (2) $7b(2a + 5b - 3c) = 14ab + 35b^2 - 21bc$
 (3) $5x(-4x - y + 6z) = -20x^2 - 5xy + 30xz$
 (4) $-m(3x + 7y - z) = -3mx - 7my + mz$
 (5) $-5c(7a - 4b - 13c) = -35ac + 20bc + 65c^2$
 (6) $(8p - 2q - 3r) \times x = 8px - 2qx - 3rx$
 (7) $(-3a + 2b - 4c) \times 3c = -9ac + 6bc - 12c^2$
 (8) $(6x - 9y + 11z) \times (-2x) = -12x^2 + 18xy - 22xz$
 (9) $(-18a + 7b - 4c) \times (-3b) = 54ab - 21b^2 + 12bc$

- 9 **解答** (1) $2a + 3$ (2) $-x + 2$ (3) $2a + 3b$ (4) $-3x - 4y$

- (1) $(2a^2 + 3a) \div a = (2a^2 + 3a) \times \frac{1}{a}$

$$= \frac{2a^2}{a} + \frac{3a}{a}$$

$$= 2a + 3$$

 (2) $(3x^2 - 6x) \div (-3x) = (3x^2 - 6x) \times \left(-\frac{1}{3x}\right)$

$$= -\frac{3x^2}{3x} + \frac{6x}{3x}$$

$$= -x + 2$$

(3) $(8a^2 + 12ab) \div 4a = (8a^2 + 12ab) \times \frac{1}{4a}$

$$= \frac{8a^2}{4a} + \frac{12ab}{4a}$$

$$= 2a + 3b$$

(4) $(15x^2y + 20xy^2) \div (-5xy) = (15x^2y + 20xy^2) \times \left(-\frac{1}{5xy}\right)$

$$= -\frac{15x^2y}{5xy} - \frac{20xy^2}{5xy}$$

$$= -3x - 4y$$

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

(1) $(24a^2b - 16ab) \div (-8ab) = (24a^2b - 16ab) \times \left(-\frac{1}{8ab}\right)$

$$= -\frac{24a^2b}{8ab} + \frac{16ab}{8ab}$$

$$= -3a + 2$$

(2) $(4x^2 + 2xy) \div \frac{2}{3}x = (4x^2 + 2xy) \times \frac{3}{2x}$

$$= \frac{4x^2 \times 3}{2x} + \frac{2xy \times 3}{2x}$$

$$= 6x + 3y$$

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

$$= \frac{3a^2b \times 2}{ab} - \frac{5ab^2 \times 2}{ab}$$

$$= 6a - 10b$$

11 解答 (1) $3a - 8$ (2) $-3x - 2y$ (3) $9a - 15$

$$\begin{aligned}(1) (6a^2 - 16a) \div 2a &= (6a^2 - 16a) \times \frac{1}{2a} \\ &= \frac{6a^2}{2a} - \frac{16a}{2a} \\ &= 3a - 8\end{aligned}$$

$$\begin{aligned}(2) (9x^2y + 6xy^2) \div (-3xy) &= (9x^2y + 6xy^2) \times \left(-\frac{1}{3xy}\right) \\ &= -\frac{9x^2y}{3xy} - \frac{6xy^2}{3xy} \\ &= -3x - 2y\end{aligned}$$

$$\begin{aligned}(3) (3ab - 5b) \div \frac{1}{3}b &= (3ab - 5b) \times \frac{3}{b} \\ &= \frac{3ab \times 3}{b} - \frac{5b \times 3}{b} \\ &= 9a - 15\end{aligned}$$

12 解答 (1) $3x + 2$ (2) $2x - 5y$ (3) $-3a + 2$ (4) $9a + 12b$ (5) $4x^2 + 6y^2$

$$\begin{aligned}(1) (12x^2 + 8x) \div 4x &= (12x^2 + 8x) \times \frac{1}{4x} \\ &= \frac{12x^2}{4x} + \frac{8x}{4x} \\ &= 3x + 2\end{aligned}$$

$$\begin{aligned}(2) (6ax - 15ay) \div 3a &= (6ax - 15ay) \times \frac{1}{3a} \\ &= \frac{6ax}{3a} - \frac{15ay}{3a} \\ &= 2x - 5y\end{aligned}$$

$$\begin{aligned}(3) (24a^2b - 16ab) \div (-8ab) &= (24a^2b - 16ab) \times \left(-\frac{1}{8ab}\right) \\ &= -\frac{24a^2b}{8ab} + \frac{16ab}{8ab} \\ &= -3a + 2\end{aligned}$$

$$\begin{aligned}(4) (6a^2 + 8ab) \div \frac{2}{3}a &= (6a^2 + 8ab) \times \frac{3}{2a} \\ &= \frac{6a^2 \times 3}{2a} + \frac{8ab \times 3}{2a}\end{aligned}$$

$$= 9a + 12b$$

$$\begin{aligned}(5) (-2x^3y - 3xy^3) \div \left(-\frac{1}{2}xy\right) &= (-2x^3y - 3xy^3) \times \left(-\frac{2}{xy}\right) \\ &= \frac{2x^3y \times 2}{xy} + \frac{3xy^3 \times 2}{xy} \\ &= 4x^2 + 6y^2\end{aligned}$$

13 解答 (1) $7-4y$ (2) $5a+3b$ (3) $3xy-4z$ (4) $-\frac{5a}{2}+c$
 (5) $2x-8$ (6) $10y-25axy$ (7) $-12p^2+8q^2$ (8) $-6b^3+10a$

$$\begin{aligned} (1) (14x-8xy) \div 2x &= (14x-8xy) \times \frac{1}{2x} \\ &= \frac{14x}{2x} - \frac{8xy}{2x} \\ &= 7-4y \end{aligned}$$

$$\begin{aligned} (2) (15a^2+9ab) \div 3a &= (15a^2+9ab) \times \frac{1}{3a} \\ &= \frac{15a^2}{3a} + \frac{9ab}{3a} \\ &= 5a+3b \end{aligned}$$

$$\begin{aligned} (3) (-12xy^2+16yz) \div (-4y) &= (-12xy^2+16yz) \times \left(-\frac{1}{4y}\right) \\ &= \frac{12xy^2}{4y} - \frac{16yz}{4y} \\ &= 3xy-4z \end{aligned}$$

$$\begin{aligned} (4) (20abc-8bc^2) \div (-8bc) &= (20abc-8bc^2) \times \left(-\frac{1}{8bc}\right) \\ &= -\frac{5a}{2}+c \end{aligned}$$

$$\begin{aligned} (5) (-xy+4y) \div \left(-\frac{1}{2}y\right) &= (-xy+4y) \times \left(-\frac{2}{y}\right) \\ &= 2x-8 \end{aligned}$$

$$\begin{aligned} (6) (12xy^2-30ax^2y^2) \div \frac{6xy}{5} &= (12xy^2-30ax^2y^2) \times \frac{5}{6xy} \\ &= 10y-25axy \end{aligned}$$

$$\begin{aligned} (7) (6p^3q^2-4pq^4) \div \left(-\frac{pq^2}{2}\right) &= (6p^3q^2-4pq^4) \times \left(-\frac{2}{pq^2}\right) \\ &= -12p^2+8q^2 \end{aligned}$$

$$\begin{aligned} (8) (-3ab^3+5a^2) \div 0.5a &= (-3ab^3+5a^2) \div \frac{a}{2} \\ &= (-3ab^3+5a^2) \times \frac{2}{a} \\ &= -6b^3+10a \end{aligned}$$

14 解答 (1) $4x^2-x$ (2) $3x^2-10xy+6y^2$ (3) $11x-12$ (4) $5x^2-3x$

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

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

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

$$\begin{aligned} (4) x(2x-1)-(6x^2-9x^3) \div 3x &= 2x^2-x-(2x-3x^2) \\ &= 2x^2-x-2x+3x^2 \\ &= 5x^2-3x \end{aligned}$$

15 解答 (1) $4x^2-3x$ (2) $9a^2$

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

$$\begin{aligned} (2) 3a(a-4b)+6a(2b+a) &= 3a^2-12ab+12ab+6a^2 \\ &= 9a^2 \end{aligned}$$