

第 1 章	数学(2 年)	名前:	日 付	No.03
	式の計算1			

[問題 1]

次の計算をなさい。

- (1) $(6x-4y)+(5x+2y)$ (2)
$$\begin{array}{r} 4x-5y \\ +) -2x+3y \\ \hline \end{array}$$
 (3) $(15a-9b)\div 3$
- (4) $3(2x-3y)+4(x-5y)$ (5) $7a\times(-4b)$ (6) $-(-2x)^2$
- (7) $(-4ab)\div(-2ab)$ (8) $24x^2y\div(-8xy^2)$ (9) $15xy\times(-2xy)\div 6y$

[解答欄]

(1) $11x-2y$	(2) $2x-2y$	(3) $5a-3b$
(4) $10x-29y$	(5) $-28ab$	(6) $-4x^2$
(7) 2	(8) $-\frac{3x}{y}$	(9) $-5x^2y$

[解説]

$$(1) (6x-4y)+(5x+2y)=6x-4y+5x+2y=6x+5x-4y+2y=11x-2y$$

$$(2) \begin{array}{r} 4x-5y \\ +) -2x+3y \\ \hline 2x-2y \end{array}$$

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

$$(4) 3(2x-3y)+4(x-5y)=6x-9y+4x-20y=6x+4x-9y-20y=10x-29y$$

$$(5) 7a\times(-4b)=7\times a\times(-4)\times b=7\times(-4)\times a\times b=-28ab$$

$$(6) -(-2x)^2=(-1)\times(-2x)\times(-2x)=(-1)\times(-2)\times x\times(-2)\times x$$

$$=(-1)\times(-2)\times(-2)\times x\times x=-4x^2$$

$$(7) (-4ab)\div(-2ab)=(-4ab)\times\left(\frac{1}{-2ab}\right)=\frac{-4ab}{-2ab}=2$$

$$(8) 24x^2y\div(-8xy^2)=24x^2y\times\frac{1}{-8xy^2}=\frac{24x^2y}{-8xy^2}=\frac{24\times x\times x\times y}{-8\times x\times y\times y}=-\frac{3x}{y}$$

$$(9) 15xy\times(-2xy)\div 6y=15xy\times(-2xy)\times\frac{1}{6y}=\frac{15xy\times(-2xy)}{6y}=\frac{15\times x\times y\times(-2)\times x\times y}{6\times y}=-5x^2y$$

[問題 2]

次の計算をなさい。

(1) $(2a+3b)+(a-6b)$

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

(3) $2(a+b)+5(2a-b)$

(4) $3(x-2y)-2(2x-5y)$

(5) $5ab \div \frac{5}{6}a$

(6) $\frac{4}{5}ab^2 \div \frac{2}{3}a^2b \times 10a$

(7) $\frac{2x+y}{2} + \frac{x-y}{5}$

(8) $x-3y - \frac{x-6y}{2}$

(9) $(-2x)^2 \times (-5y)$

[解答欄]

(1) $3a-3b$	(2) $x+6y$	(3) $12a-3b$
(4) $-x+4y$	(5) $6b$	(6) $12b$
(7) $\frac{12x+3y}{10}$	(8) $\frac{x}{2}$	(9) $-20x^2y$

[解説]

(1) $(2a+3b)+(a-6b)=2a+3b+a-6b=2a+a+3b-6b=3a-3b$

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

(3) $2(a+b)+5(2a-b)=2a+2b+10a-5b=2a+10a+2b-5b=12a-3b$

(4) $3(x-2y)-2(2x-5y)=3x-6y-4x+10y=3x-4x-6y+10y=-x+4y$

(5) $5ab \div \frac{5}{6}a = 5ab \div \frac{5a}{6} = 5ab \times \frac{6}{5a} = \frac{5ab \times 6}{5a} = \frac{5 \times a \times b \times 6}{5 \times a} = 6b$

$$(6) \frac{4}{5}ab^2 \div \frac{2}{3}a^2b \times 10a = \frac{4ab^2}{5} \div \frac{2a^2b}{3} \times 10a = \frac{4ab^2}{5} \times \frac{3}{2a^2b} \times 10a = \frac{4ab^2 \times 3 \times 10a}{5 \times 2a^2b}$$

$$= \frac{4 \times a \times b \times b \times 3 \times 10 \times a}{5 \times 2 \times a \times a \times b} = 12b$$

$$(7) \frac{2x+y}{2} + \frac{x-y}{5} = \frac{(2x+y) \times 5}{2 \times 5} + \frac{(x-y) \times 2}{5 \times 2} = \frac{5(2x+y) + 2(x-y)}{10} = \frac{10x+5y+2x-2y}{10}$$

$$= \frac{10x+2x+5y-2y}{10} = \frac{12x+3y}{10}$$

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

$$= \frac{2x-x-6y+6y}{2} = \frac{x}{2}$$

(9) $(-2x)^2 \times (-5y) = (-2x) \times (-2x) \times (-5y) = (-2) \times x \times (-2) \times x \times (-5) \times y = -20x^2y$

[問題 3]

次の計算をせよ。

$$(1) 3(a-3b)+2(2a-b) \quad (2) 5(3x-4y)-2(2x-6y) \quad (3) \frac{1}{2}(6x-4y)-\frac{2}{3}(9x-3y)$$

$$(4) 6x^2y \times 2xy \div 4xy^2 \quad (5) 2a^2b \div \frac{2}{5}a \times (-4b) \quad (6) \frac{3}{2}xy^2 \div \frac{3}{4}x^2y \div \left(-\frac{2}{5}xy\right)$$

$$(7) \frac{a-2b}{3} + \frac{a-b}{4} \quad (8) \frac{3x-2y}{2} - \frac{5x-4y}{3}$$

[解答欄]

(1) $7a-11b$	(2) $11x-8y$	(3) $-3x$
(4) $3x^2$	(5) $-20ab^2$	(6) $-\frac{5}{x^2}$
(7) $\frac{7a-11b}{12}$	(8) $\frac{-x+2y}{6}$	

[解説]

$$(1) 3(a-3b)+2(2a-b)=3a-9b+4a-2b=3a+4a-9b-2b=7a-11b$$

$$(2) 5(3x-4y)-2(2x-6y)=15x-20y-4x+12y=15x-4x-20y+12y=11x-8y$$

$$(3) \frac{1}{2}(6x-4y)-\frac{2}{3}(9x-3y)=\frac{1}{2} \times 6x + \frac{1}{2} \times (-4y) - \frac{2}{3} \times 9x - \frac{2}{3} \times (-3y) \\ = 3x - 2y - 6x + 2y = 3x - 6x - 2y + 2y = -3x$$

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

$$(5) 2a^2b \div \frac{2}{5}a \times (-4b) = 2a^2b \times \frac{5}{2a} \times (-4b) = \frac{2a^2b \times 5 \times (-4b)}{2a} = -20ab^2$$

$$(6) \frac{3}{2}xy^2 \div \frac{3}{4}x^2y \div \left(-\frac{2}{5}xy\right) = \frac{3xy^2}{2} \div \frac{3x^2y}{4} \div \frac{-2xy}{5} = \frac{3xy^2}{2} \times \frac{4}{3x^2y} \times \frac{5}{-2xy} \\ = \frac{3xy^2 \times 4 \times 5}{2 \times 3x^2y \times (-2xy)} = -\frac{5}{x^2}$$

$$(7) \frac{a-2b}{3} + \frac{a-b}{4} = \frac{(a-2b) \times 4}{3 \times 4} + \frac{(a-b) \times 3}{4 \times 3} = \frac{4(a-2b)+3(a-b)}{12} = \frac{4a-8b+3a-3b}{12} \\ = \frac{4a+3a-8b-3b}{12} = \frac{7a-11b}{12}$$

$$(8) \frac{3x-2y}{2} - \frac{5x-4y}{3} = \frac{(3x-2y) \times 3}{2 \times 3} - \frac{(5x-4y) \times 2}{3 \times 2} = \frac{3(3x-2y)}{6} - \frac{2(5x-4y)}{6} \\ = \frac{3(3x-2y)-2(5x-4y)}{6} = \frac{9x-6y-10x+8y}{6} = \frac{9x-10x-6y+8y}{6} = \frac{-x+2y}{6}$$

[問題](1 学期中間)

次の計算をなさい。

(1) $3x - y + x + y$

(2) $(3a + 2b) + (a + 5b)$

(3) $(x - 3y) - (3x - 7y)$

(4)
$$\begin{array}{r} 3x^2 - 4x - 2 \\ +) x^2 + 5x + 1 \\ \hline \end{array}$$

(5)
$$\begin{array}{r} -3a - 2 \\ -) -2a + 3 \\ \hline \end{array}$$

(6) $3x \times 2y$

(7) $-(-2y)^3$

(8) $-a^2 \div a$

(9) $21xy^2 \div (-35x^2y)$

(10) $6ab^2 \div \frac{2}{3}a$

(11) $(6x^2 - 3x) \times (-4)$

(12) $(2x^2 - 3x) \div \frac{3}{2}$

[解答欄]

(1) $4x$	(2) $4a + 7b$	(3) $-2x + 4y$
(4) $4x^2 + x - 1$	(5) $-a - 5$	(6) $6xy$
(7) $8y^3$	(8) $-a$	(9) $-\frac{3y}{5x}$
(10) $9b^2$	(11) $-24x^2 + 12x$	(12) $\frac{4}{3}x^2 - 2x$

[解説]

(1) まず並びかえて同類項をまとめ、次に同類項の係数を計算(分配法則: $ax + bx = (a + b)x$)。

$$3x - y + x + y = 3x + x - y + y = (3 + 1)x + (-1 + 1)y = 4x + 0y = 4x$$

(2) ()の前が+ならそのまま()をはずす。－なら()内の符号をすべて逆転。

$$(3a + 2b) + (a + 5b) = 3a + 2b + a + 5b = 3a + a + 2b + 5b = (3 + 1)a + (2 + 5)b = 4a + 7b$$

$$(3) (x - 3y) - (3x - 7y) = x - 3y - 3x + 7y = x - 3x - 3y + 7y = (1 - 3)x + (-3 + 7)y = -2x + 4y$$

$$3x^2 - 4x - 2$$

$$(4) \text{各項の係数どうしを計算 } \begin{array}{r} +) x^2 + 5x + 1 \\ \hline (3 + 1)x^2 + (-4 + 5)x + (-2 + 1) \end{array}$$

(5) 縦にそろえて計算する引き算の場合、下の項の符号を逆転してたし算にする。

$$\begin{array}{r} -3a - 2 \\ -) -2a + 3 \\ \hline \end{array} \rightarrow \begin{array}{r} -3a - 2 \\ +) +2a - 3 \\ \hline \end{array} \rightarrow \begin{array}{r} -3a - 2 \\ +) +2a - 3 \\ \hline -a - 5 \end{array}$$

(6) 乗法: 並べかえて、数字は数字どうし、それぞれの文字は文字どうしかけ算

$$3x \times 2y = 3 \times x \times 2 \times y = 3 \times 2 \times x \times y = 6xy$$

$$(7) \quad -(-2y)^3 = -\{(-2)^3 \times y^3\} = -\{(-8) \times y^3\} = -(-8y^3) = 8y^3$$

$$(8) \quad \text{除法：逆数を使ってかけ算に直す} (\div A \rightarrow \times \frac{1}{A}) (\div \frac{A}{B} \rightarrow \times \frac{B}{A})$$

$$-a^2 \div a = -a^2 \times \frac{1}{a} = -a$$

$$(9) \quad 21xy^2 \div (-35x^2y) = \frac{21xy^2}{-35x^2y} = -\frac{21 \times x \times y \times y}{35 \times x \times x \times y} = -\frac{3 \times y}{5 \times x} = -\frac{3y}{5x}$$

$$(10) \quad 6ab^2 \div \frac{2}{3}a = 6ab^2 \div \frac{2a}{3} = 6ab^2 \times \frac{3}{2a} = \frac{6ab^2 \times 3}{2a} = \frac{6 \times 3 \times a \times b \times b}{2 \times a} = 9b^2$$

$$(11) \quad (6x^2 - 3x) \times (-4) = 6x^2 \times (-4) + (-3x) \times (-4) = -24x^2 + 12x$$

$$(12) \quad (2x^2 - 3x) \div \frac{3}{2} = (2x^2 - 3x) \times \frac{2}{3} = 2x^2 \times \frac{2}{3} + (-3x) \times \frac{2}{3} = \frac{4}{3}x^2 - 2x$$