

『数が苦』を『数楽』にその11

年 組 番 氏名

【4】2年1章 式の計算

式の計算1

次の計算をなさい。

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

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

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

$$(4) \quad (8x + 4y) - (2x - 5y) \\ = 6x + 9y$$

$$(5) \quad \begin{array}{r} 8x + 6y + 4 \\ -) 12x - 3y - 3 \\ \hline -4x + 9y + 7 \end{array}$$

$$(6) \quad (x - 2y) \times (-4) \\ = -4x + 8y$$

$$(7) \quad (4x^2 + 12x - 8) \times \left(-\frac{1}{4}\right) \\ = -x^2 - 3x + 2$$

$$(8) \quad 3x + 2(x + 2y) \\ = 5x + 4y$$

$$(9) \quad 4(a + 5b - 2) - 3(a - b - 3) \\ = a + 23b + 1$$

$$(10) \quad (8x + 20y) \div 4 \\ = 2x + 5y$$

$$(11) \quad \frac{6x-10y}{3} - 3x \\ = \frac{6x-10y}{3} - \frac{9x}{3} \\ = \frac{-3x-10y}{3} \quad \left(= -\frac{3x+10y}{3} \right)$$

$$(12) \quad \frac{4x-3y}{2} + \frac{x+y}{2} \\ = \frac{5x-2y}{2}$$

$$(13) \quad 3a \times 4b \\ = 12ab$$

$$(14) \quad (-7ab) \times 2c \\ = -14abc$$

$$(15) \quad 6a \times (-3a) \\ = -18a^2$$

$$(16) \quad 6ab \div 3b \\ = 2a$$

$$(17) \quad 6ab \div \frac{3}{2}b \\ = 4a$$

$$(18) \quad 6a^2 \times b \div 3a \\ = 2ab$$

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【4】2年1章 式の計算

式の計算2

次の計算をなさい。

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

$$(2) \quad (3a - 4b + 6) + (-3a - 2b - 7) \\ = -6b - 1$$

$$(3) \quad \begin{array}{r} x^2 - 4x - 7 \\ +) -3x^2 + 10x - 4 \\ \hline -2x^2 + 6x - 11 \end{array}$$

$$(4) \quad (4x^2 + 5x - 6) - (7x^2 + 9x - 3) \\ = -3x^2 - 4x - 3$$

$$(5) \quad \begin{array}{r} 8a + 6b \\ -) 4a - 2b \\ \hline 4a + 8b \end{array}$$

$$(6) \quad 4(6x - 5y) \\ = 24x - 20y$$

$$(7) \quad (-2a + 3b - 1) \times \left(-\frac{5}{6}\right) \\ = \frac{5}{3}a - \frac{5}{2}b + \frac{5}{6}$$

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

$$(9) \quad -4(4a - 5b) - 6(-8a + 6b - 1) \\ = 32a - 16b + 6$$

$$(10) \quad (-6x + 9y) \div 3 \\ = -2x + 3y$$

$$(11) \quad \frac{x-3y}{2} - \frac{x+y}{3} \\ = \frac{3x-9y-2x-2y}{6} \\ = \frac{x-11y}{6}$$

$$(12) \quad \frac{3a-b}{3} - \frac{3a-2b}{4} \\ = \frac{12a-4b-9a+6b}{12} \\ = \frac{-3a+2b}{12}$$

$$(13) \quad 4x \times (-8y) \\ = -32xy$$

$$(14) \quad (-2xy) \times \left(-\frac{3}{8}y\right) \\ = \frac{3}{4}xy^2$$

$$(15) \quad (-9a)^2 \\ = 81a^2$$

$$(16) \quad (-6a^2b^3) \div (2ab)^2 \\ = -\frac{3}{2}b$$

$$(17) \quad \frac{xy^2}{3} \div \frac{xy}{6} \\ = 2y$$

$$(18) \quad 6a^2b \div (-3ab) \times 2ab \\ = -4a^2b$$

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【4】2年1章 式の計算

等式の変形

次の式を〔 〕の中の文字について解きなさい。

(1) $y = 12 - 4x$ [x]

$$4x = 12 - y$$

$$x = \frac{12-y}{4}$$

(2) $6x + 4y = 10$ [y]

$$4y = 10 - 6x$$

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

(3) $3x + 2y = 12$ [x]

$$3x = 12 - 2y$$

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

(4) $-3x + 5y + 10 = 0$ [y]

$$5y = 3x - 10$$

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

(5) $m = \frac{a+b}{3}$ [b]

$$3m = a + b$$

$$b = 3m - a$$

(6) $c = ab$ [a]

$$ab = c$$

$$a = \frac{c}{b}$$

(7) $2(x + y) = 30$ [y]

$$2x + 2y = 30$$

$$2y = -2x + 30$$

$$y = -x + 15$$

(8) $V = \frac{1}{3} \pi r^2 h$ [h]

$$3V = \pi r^2 h$$

$$\pi r^2 h = 3V$$

$$h = \frac{3V}{\pi r^2}$$

(9) $S = \frac{1}{2} (a + b)h$ [a]

$$2S = ah + bh$$

$$ah + bh = 2S$$

$$ah = 2S - bh$$

$$a = \frac{2S-bh}{h}$$

(10) $a = \frac{3b+5c}{4}$ [c]

$$4a = 3b + 5c$$

$$3b + 5c = 4a$$

$$5c = 4a - 3b$$

$$c = \frac{4a-3b}{5}$$

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【5】1年2章 連立方程式

連立方程式1

次の計算をなさい。

$$(1) \begin{cases} x + y = 7 \dots ① \\ x - y = 3 \dots ② \end{cases}$$

[解答]

$$\begin{array}{r} ① \quad x + y = 7 \\ +) ② \quad x - y = 3 \\ \hline \quad 2x = 10 \\ \quad x = 5 \end{array}$$

$$\begin{array}{l} x = 5 \text{を} ① \text{に代入} \\ 5 + y = 7 \\ y = 5 - 7 \\ y = 2 \end{array}$$

$$\text{答え} \begin{cases} x = 5 \\ y = 2 \end{cases}$$

$$(2) \begin{cases} 2x + y = 13 \dots ① \\ x - y = 2 \dots ② \end{cases}$$

[解答]

$$\begin{array}{r} ① \quad 2x + y = 13 \\ +) ② \quad x - y = 2 \\ \hline \quad 3x = 15 \\ \quad x = 5 \end{array}$$

$$\begin{array}{l} x = 5 \text{を} ① \text{に代入} \\ 10 + y = 13 \\ y = 13 - 10 \\ y = 3 \end{array}$$

$$\text{答え} \begin{cases} x = 5 \\ y = 3 \end{cases}$$

$$(3) \begin{cases} -2x + 3y = 12 \dots ① \\ 5x - 4y = -9 \dots ② \end{cases}$$

[解答]

$$\begin{array}{r} ① \times 5 \quad -10x + 15y = 60 \\ +) ② \times 2 \quad 10x - 8y = -18 \\ \hline \quad \quad 7y = 42 \\ \quad \quad y = 6 \end{array}$$

$$\begin{array}{l} y = 6 \text{を} ① \text{に代入} \\ -2x + 18 = 12 \\ -2x = 12 - 18 \\ -2x = -6 \\ x = 3 \end{array}$$

$$\text{答え} \begin{cases} x = 3 \\ y = 6 \end{cases}$$

$$(4) \begin{cases} x = y \dots ① \\ x + y = 4 \dots ② \end{cases}$$

[解答]①を②に代入

$$\begin{array}{l} y + y = 4 \\ 2y = 4 \\ y = 2 \end{array}$$

$y = 2$ を①に代入

$$x = 2$$

$$\text{答え} \begin{cases} x = 2 \\ y = 2 \end{cases}$$

$$(5) \begin{cases} y = 2x + 3 \dots ① \\ x - y = 2 \dots ② \end{cases}$$

[解答]①を②に代入

$$\begin{array}{l} x - (2x + 3) = 2 \\ x - 2x - 3 = 2 \\ -x = 5 \\ x = -5 \end{array}$$

$$\begin{array}{l} x = -5 \text{を} ① \text{に代入} \\ y = -10 + 3 \\ y = -7 \end{array}$$

$$\text{答え} \begin{cases} x = -5 \\ y = -7 \end{cases}$$

$$(6) \begin{cases} 2y = 2x + 4 \dots ① \\ x - 4y = 1 \dots ② \end{cases}$$

[解答]①×2 $4y = 4x + 8$
これを②に代入

$$\begin{array}{l} x - (4x + 8) = 1 \\ x - 4x - 8 = 1 \\ -3x = 9 \\ x = -3 \end{array}$$

$$\begin{array}{l} x = -3 \text{を} ① \text{に代入} \\ 2y = -6 + 4 \\ 2y = -2 \\ y = -1 \end{array}$$

$$\text{答え} \begin{cases} x = -3 \\ y = -1 \end{cases}$$

$$(7) \begin{cases} x - 3y = 12 \dots ① \\ 5x - 2y = 8 \dots ② \end{cases}$$

[解答]①より $x = 3y + 12 \dots ①'$

$$①' \times 5 \quad 5x = 15y + 60$$

これを②に代入

$$\begin{array}{l} 15y + 60 - 2y = 8 \\ 13y = -52 \\ y = -4 \end{array}$$

$$\begin{array}{l} y = -4 \text{を} ①' \text{に代入} \\ x = -12 + 12 \\ x = 0 \end{array}$$

$$\text{答え} \begin{cases} x = 0 \\ y = -4 \end{cases}$$

$$(8) \begin{cases} x + 3y = y + 4 \dots ① \\ 3x - y = x + 3 \dots ② \end{cases}$$

[解答]①より

$$x + 2y = 4 \dots ①'$$

②より

$$2x - y = 3 \dots ②'$$

$$①' \times 2 \quad 2x + 4y = 8$$

$$-) ②' \quad 2x - y = 3$$

$$\begin{array}{l} 5y = 5 \\ y = 1 \end{array}$$

$y = 1$ を①'に代入

$$\begin{array}{l} x + 2 = 4 \\ x = 2 \end{array}$$

$$\text{答え} \begin{cases} x = 3 \\ y = 7 \end{cases}$$

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【5】2年1章 連立方程式

連立方程式2

次の計算をなさい。

$$(1) \begin{cases} 2(3x - y) = 5x + y + 11 & \dots \textcircled{1} \\ 2x - 3(y + 5) = 1 & \dots \textcircled{2} \end{cases}$$

【解答】①より $6x - 2y = 5x + y + 11$

$$x - 3y = 11 \dots \textcircled{1}'$$

②より $2x - 3y - 15 = 1$

$$2x - 3y = 16 \dots \textcircled{2}'$$

$$\textcircled{1}' \quad x - 3y = 11$$

$$-)\textcircled{2}' \quad 2x - 3y = 16$$

$$-x = -5$$

$$x = 5$$

$x = 5$ を①'に代入

$$5 - 3y = 11$$

$$-3y = 6$$

$$y = -2$$

$$\text{答え} \begin{cases} x = 5 \\ y = -2 \end{cases}$$

$$(2) \begin{cases} 0.7x - 0.2y = 3 \dots \textcircled{1} \\ 1.4x - 0.5y = 4 \dots \textcircled{2} \end{cases}$$

【解答】①×10 $7x - 2y = 30 \dots \textcircled{1}'$

②×10 $14x - 5y = 40 \dots \textcircled{2}'$

$$\textcircled{1}' \times 2 \quad 14x - 4y = 60$$

$$-)\textcircled{2}' \quad 14x - 5y = 40$$

$$y = 20$$

$y = 20$ を①'に代入

$$7x - 40 = 30$$

$$7x = 70$$

$$x = 10$$

$$\text{答え} \begin{cases} x = 10 \\ y = 20 \end{cases}$$

$$(3) \begin{cases} \frac{x-4}{3} = \frac{y-1}{2} \dots \textcircled{1} \\ 5x - 2y = 7 \dots \textcircled{2} \end{cases}$$

【解答】

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

$$2x - 8 = 3y - 3$$

$$2x - 3y = 5 \dots \textcircled{1}'$$

$$\textcircled{1}' \times 2 \quad 4x - 6y = 10$$

$$-)\textcircled{2} \times 3 \quad 15x - 6y = 21$$

$$-11x = -11$$

$$x = 1$$

$x = 1$ を①'に代入

$$2 - 3y = 5$$

$$-3y = 3$$

$$y = -1$$

$$\text{答え} \begin{cases} x = 1 \\ y = -1 \end{cases}$$

$$(4) \quad 3x - y = 7x + y = x + 2y + 8$$

【解答】 $3x - y = x + 2y + 8$

$$2x - 3y = 8 \dots \textcircled{1}$$

$$7x + y = x + 2y + 8$$

$$6x - y = 8 \dots \textcircled{2}$$

$$\textcircled{1} \times 3 \quad 6x - 9y = 24$$

$$-)\textcircled{2} \quad 6x - y = 8$$

$$-8y = 16$$

$$y = -2$$

$y = -2$ を①に代入

$$2x + 6 = 8$$

$$2x = 2$$

$$x = 1$$

$$\text{答え} \begin{cases} x = 1 \\ y = -2 \end{cases}$$

$$(5) \begin{cases} 3 : 5 = y : 2x \dots \textcircled{1} \\ -2(2x - y) = 4 \dots \textcircled{2} \end{cases}$$

【解答】①より $6x = 5y \dots \textcircled{1}'$

②より $-4x + 2y = 4$

$$-2x + y = 2$$

$$y = 2x - 2 \dots \textcircled{2}'$$

これを、①'に代入

$$6x = 5(2x - 2)$$

$$6x = 10x - 10$$

$$-4x = -10$$

$$x = \frac{5}{2}$$

$x = \frac{5}{2}$ を②'に代入

代入

$$y = 5 - 2$$

$$y = 3$$

$$\text{答え} \begin{cases} x = \frac{5}{2} \\ y = 3 \end{cases}$$

$$(6) \begin{cases} 0.6x + 1.4y = 7.4 \dots \textcircled{1} \\ 5(x + 3y) = -5y + 70 \dots \textcircled{2} \end{cases}$$

【解答】①×10 $6x + 14y = 74 \dots \textcircled{1}'$

②より $5x + 15y = -5y + 70$

$$5x + 10y = 70$$

両辺を5で割る

$$x + 2y = 14$$

$$x = -2y + 14 \dots \textcircled{2}'$$

②'を①'に代入

$$6(-2y + 14) = 74$$

$$-12y + 84 = 74$$

$$-12y = -10$$

$$y = 1$$

$y = 1$ を②'に代入

$$x + 2 = 14$$

$$x = 12$$

$$\text{答え} \begin{cases} x = 12 \\ y = 1 \end{cases}$$

$$(7) \begin{cases} 0.07x + 0.14y = -0.25 \dots \textcircled{1} \\ \frac{5}{6}x + \frac{1}{2}y = -3 \dots \textcircled{2} \end{cases}$$

【解答】

①×100

$$7x + 14y = -25 \dots \textcircled{1}'$$

$$\textcircled{2} \times 42 \quad 35x + 72y = -126$$

$$-)\textcircled{1}' \times 5 \quad 35x + 70y = -125$$

$$2y = -1$$

$$y = -\frac{1}{2}$$

$y = -\frac{1}{2}$ を①'に代入

$$7x + 14 \times \left(-\frac{1}{2}\right) = -25$$

$$7x - 7 = -25$$

$$7x = -18$$

$$x = -\frac{18}{7}$$

$$\text{答え} \begin{cases} x = -\frac{18}{7} \\ y = -\frac{1}{2} \end{cases}$$

$$(8) \begin{cases} 3.2x - 1.6 = 1.5y \dots \textcircled{1} \\ 6x - 2y = -4(x - 2y) - 7 \dots \textcircled{2} \end{cases}$$

【解答】

$$\textcircled{1} \times 10 \quad 32x - 16 = 15y$$

$$32x - 15y = 16 \dots \textcircled{1}'$$

②より $6x - 2y = -4x + 8y - 7$

$$10x - 10y = -7 \dots \textcircled{2}'$$

$$\textcircled{1}' \times 2 \quad 64x - 30y = 32$$

$$-)\textcircled{2}' \times 3 \quad 30x - 30y = -70$$

$$34x = 102$$

$$x = 3$$

$x = 3$ を②'に代入

$$30 - 10y = -7$$

$$-10y = -37$$

$$y = \frac{37}{10}$$

$$\text{答え} \begin{cases} x = 3 \\ y = \frac{37}{10} \end{cases}$$