

## 計算の練習 1 - ①

名前

※ 解法は一例です。

■ (1) ~ (16) の計算をしなさい。(17) ~ (20) は方程式を解きなさい。

$$(1) -7 + (-5) = -(7+5) \\ = -12$$

$$(2) (-6) - (+9) = (-6) + (-9) \\ = -15$$

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

$$(4) (5x+2) - (2x-5) = 5x+2-2x+5 \\ = (5-2)x + (2+5) \\ = 3x+7$$

$$(5) (-7) \times (-4) = +(7 \times 4) \\ = 28$$

$$(6) (-36) \div (+12) = -(36 \div 12) \\ = -3$$

$$(7) 5a \times (-2) = -10a$$

$$(8) -32x \div 4 = -8x$$

$$(9) (+8) + (-6) + (-1) = 8-6-1 \\ = 1$$

$$(10) 6 \div 15 \times (-20) = 6 \times \frac{1}{15} \times (-20) \\ = -\left(6 \times \frac{1}{15} \times 20\right) \\ = -8$$

$$(11) \frac{x-1}{2} \times 4 = \frac{(x-1) \times 4}{2} \\ = (x-1) \times 2 \\ = 2x-2$$

$$(12) (12a-6) \div 2 = \frac{12a-6}{2} \\ = \frac{12a}{2} + \left(-\frac{6}{2}\right) \\ = 6a-3$$

$$(13) 4+3^2+(-5) = 4+9+(-5) \\ = 13-5 \\ = 8$$

$$(14) 15 - (-21) \div \left(-\frac{3}{4}\right) = 15 - (-21) \times \left(-\frac{4}{3}\right) \\ = 15 - (+28) \\ = 15 - 28 \\ = -13$$

$$(15) \frac{1}{2}(4x+2) + \frac{1}{3}(6x+3) = 2x+1+2x+1 \\ = 4x+2$$

$$(16) \frac{1}{4}(8a+4) - \frac{1}{2}(2a-6) = 2a+1-a+3 \\ = a+4$$

$$(17) 3x+1 = -8 \\ 3x = -8-1 \\ 3x = -9 \\ x = -3$$

$$(18) 4(x+3) = 3x+7 \\ 4x+12 = 3x+7 \\ 4x-3x = 7-12 \\ x = -5$$

$$(19) 0.3x-0.5 = 1 \quad \text{両辺に 10 をかけて}$$

$$(0.3x-0.5) \times 10 = 1 \times 10 \\ 3x-5 = 10 \\ 3x = 15 \\ x = 5$$

$$(20) \frac{1}{2}x = \frac{1}{3}x + 2 \quad \text{両辺に 6 をかけて}$$

$$\frac{1}{2}x \times 6 = \left(\frac{1}{3}x + 2\right) \times 6 \\ 3x = 2x + 12 \\ 3x - 2x = 12 \\ x = 12$$

# 計算の練習2 - ①

■ (1) ~ (12) の計算をしなさい。(13)、(14) は連立方程式を解きなさい。

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

$$\begin{aligned} (3) \quad 21ab \div 6a &= \frac{21ab}{6a} \\ &= \frac{21 \times a \times b}{6 \times a} \\ &= \frac{7}{2}b \end{aligned}$$

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

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

$$\begin{aligned} (9) \quad (18x-12y) \div 6 &= \frac{18x}{6} - \frac{12y}{6} \\ &= 3x-2y \end{aligned}$$

$$\begin{aligned} (11) \quad \frac{3a-2b}{4} - \frac{a+b}{6} \\ &= \frac{3(3a-2b)}{12} - \frac{2(a+b)}{12} \\ &= \frac{3(3a-2b)-2(a+b)}{12} \\ &= \frac{9a-6b-2a-2b}{12} \\ &= \frac{7a-8b}{12} \end{aligned}$$

$$(13) \quad \begin{cases} y=2x & \dots\dots ① \\ 2x+y=16 & \dots\dots ② \end{cases}$$

① を ② に代入すると

$$\begin{aligned} 2x+2x &= 16 \\ 4x &= 16 \\ x &= 4 \end{aligned}$$

$x=4$  を ① に代入すると

$$\begin{aligned} y &= 2 \times 4 \\ y &= 8 \end{aligned}$$

よって  $x=4, y=8$

$$\begin{aligned} (2) \quad (5x+7y) - (6x-y) + (8x+10y) \\ &= 5x+7y-6x+y+8x+10y \\ &= (5-6+8)x + (7+1+10)y \\ &= 7x+18y \end{aligned}$$

$$\begin{aligned} (4) \quad 3a^2b \div 2ab \times 6b^2 &= \frac{3a^2b \times 6b^2}{2ab} \\ &= 9ab^2 \end{aligned}$$

$$\begin{aligned} (6) \quad (2a^2+3a-1) + (-a^2+4a+5) \\ &= 2a^2+3a-1-a^2+4a+5 \\ &= (2-1)a^2 + (3+4)a + (-1+5) \\ &= a^2+7a+4 \end{aligned}$$

$$\begin{aligned} (8) \quad (-3a)^2 &= (-3a) \times (-3a) \\ &= (-3) \times (-3) \times a \times a \\ &= 9a^2 \end{aligned}$$

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

$$\begin{aligned} (12) \quad 10a - \{3b + (9a - b) - 1\} \\ &= 10a - (3b + 9a - b - 1) \\ &= 10a - 3b - 9a + b + 1 \\ &= (10-9)a + (-3+1)b + 1 \\ &= a - 2b + 1 \end{aligned}$$

$$(14) \quad \begin{cases} 2x+3y=13 & \dots\dots ① \\ 3x+2y=12 & \dots\dots ② \end{cases}$$

$$\begin{array}{r} ① \times 3 \quad \quad \quad 6x+9y=39 \\ ② \times 2 \quad \quad \quad -) \quad 6x+4y=24 \\ \hline \quad \quad \quad \quad \quad \quad \quad \quad 5y=15 \\ \quad \quad \quad \quad \quad \quad \quad \quad y=3 \end{array}$$

$y=3$  を ② に代入すると

$$\begin{aligned} 3x+6 &= 12 \\ 3x &= 6 \\ x &= 2 \end{aligned}$$

よって  $x=2, y=3$

# 計算の練習2 - ②

名前

※ 解法は一例です。

■ (1) ~ (12) の計算をしなさい。(13)、(14) は連立方程式を解きなさい。

$$(1) \frac{1}{3}(12x + 18y) = \frac{1}{3} \times 12x + \frac{1}{3} \times 18y$$

$$= 4x + 6y$$

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

$$= 3x - 2y - 5x + 4y$$

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

$$= -2x + 2y$$

$$(5) (-2a)^2 = (-2a) \times (-2a)$$

$$= (-2) \times (-2) \times a \times a$$

$$= 4a^2$$

$$(7) \frac{5a - 2b}{2} - \frac{2a + b}{3}$$

$$= \frac{3(5a - 2b)}{6} - \frac{2(2a + b)}{6}$$

$$= \frac{3(5a - 2b) - 2(2a + b)}{6}$$

$$= \frac{15a - 6b - 4a - 2b}{6}$$

$$= \frac{11a - 8b}{6}$$

$$(9) 24ab \div 6b = \frac{24ab}{6b}$$

$$= \frac{24 \times a \times b}{6 \times b}$$

$$= 4a$$

$$(11) 5a \times (-3bc) = 5 \times a \times (-3) \times b \times c$$

$$= 5 \times (-3) \times a \times b \times c$$

$$= -15abc$$

$$(13) \begin{cases} 2x + 3y = 24 & \dots\dots ① \\ 3x - 5y = 17 & \dots\dots ② \end{cases}$$

$$\begin{array}{r} ① \times 3 \quad 6x + 9y = 72 \\ ② \times 2 \quad -) 6x - 10y = 34 \\ \hline 19y = 38 \\ y = 2 \end{array}$$

$y = 2$  を ① に代入すると

$$2x + 6 = 24$$

$$2x = 18$$

$$x = 9$$

よって  $x = 9, y = 2$

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

$$= 16a^2b$$

$$(4) (3a^2 + 2a - 1) + (-2a^2 + 5a + 9)$$

$$= 3a^2 + 2a - 1 - 2a^2 + 5a + 9$$

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

$$= a^2 + 7a + 8$$

$$(6) (24x - 20y) \div 4 = \frac{24x}{4} - \frac{20y}{4}$$

$$= 6x - 5y$$

$$(8) 9a - \{3b + (5a - 7b) - 1\}$$

$$= 9a - (3b + 5a - 7b - 1)$$

$$= 9a - 3b - 5a + 7b + 1$$

$$= (9 - 5)a + (-3 + 7)b + 1$$

$$= 4a + 4b + 1$$

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

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

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

$$= 4x + 9y$$

$$(12) 3(x + y) + 4(x - 3y)$$

$$= 3x + 3y + 4x - 12y$$

$$= (3 + 4)x + (3 - 12)y$$

$$= 7x - 9y$$

$$(14) \begin{cases} x - 2y = 7 & \dots\dots ① \\ y = -3x & \dots\dots ② \end{cases}$$

② を ① に代入すると

$$x - 2 \times (-3x) = 7$$

$$7x = 7$$

$$x = 1$$

$x = 1$  を ② に代入すると

$$y = -3 \times 1 = -3$$

よって  $x = 1, y = -3$

## 計算の練習3 - ①

名前

※ 解法は一例です。

■ (1) ~ (8) の計算をなさい。(9) ~ (12) は展開をなさい。(13) ~ (16) は因数分解をなさい。17) ~ (20) は二次方程式を解きなさい。

$$\begin{aligned} (1) \quad \sqrt{28} \div \sqrt{2} &= \frac{\sqrt{28}}{\sqrt{2}} \\ &= \sqrt{\frac{28}{2}} \\ &= \sqrt{14} \end{aligned}$$

$$\begin{aligned} (3) \quad 3\sqrt{6} \div \sqrt{2} \times 4\sqrt{3} &= \frac{3\sqrt{6} \times 4\sqrt{3}}{\sqrt{2}} \\ &= 3\sqrt{3} \times 4\sqrt{3} \\ &= 36 \end{aligned}$$

$$\begin{aligned} (5) \quad \sqrt{35} \times 2\sqrt{7} &= \sqrt{5 \times 7} \times 2\sqrt{7} \\ &= 14\sqrt{5} \end{aligned}$$

$$\begin{aligned} (7) \quad \sqrt{28} - \sqrt{7} &= 2\sqrt{7} - \sqrt{7} \\ &= \sqrt{7} \end{aligned}$$

$$\begin{aligned} (9) \quad (x+3)(x+7) &= x^2 + (3+7)x + 3 \times 7 \\ &= x^2 + 10x + 21 \end{aligned}$$

$$\begin{aligned} (11) \quad (x-3)^2 &= x^2 - 2 \times x \times 3 + 3^2 \\ &= x^2 - 6x + 9 \end{aligned}$$

$$\begin{aligned} (13) \quad 2x^2 + 14x + 20 &= 2(x^2 + 7x + 10) \\ &= 2(x+2)(x+5) \end{aligned}$$

$$\begin{aligned} (15) \quad a^2 + 12a + 36 &= a^2 + 2 \times 6 \times a + 6^2 \\ &= (a+6)^2 \end{aligned}$$

$$(17) \quad x^2 + 8x + 12 = 0$$

左辺を因数分解すると  $(x+2)(x+6) = 0$

よって  $x+2=0$  または  $x+6=0$

したがって  $x=-2, -6$

$$(19) \quad (x+5)(x+3) = 2(x^2+3)$$

を整理すると  $x^2 - 8x - 9 = 0$

左辺を因数分解すると  $(x+1)(x-9) = 0$

よって  $x+1=0$  または  $x-9=0$

したがって  $x=-1, 9$

$$\begin{aligned} (2) \quad 2a(a-2) + 3a(1+3a) \\ &= 2a^2 - 4a + 3a + 9a^2 \\ &= 11a^2 - a \end{aligned}$$

$$\begin{aligned} (4) \quad 5\sqrt{5} - \sqrt{2} - 3\sqrt{5} + 4\sqrt{2} \\ &= (5-3)\sqrt{5} + (-1+4)\sqrt{2} \\ &= 2\sqrt{5} + 3\sqrt{2} \end{aligned}$$

$$\begin{aligned} (6) \quad 4a(a-2b-2) \\ &= 4a \times a - 4a \times 2b - 4a \times 2 \\ &= 4a^2 - 8ab - 8a \end{aligned}$$

$$\begin{aligned} (8) \quad (6x^2 - 9x) \div (-3x) &= -\frac{6x^2}{3x} - \left(-\frac{9x}{3x}\right) \\ &= -2x + 3 \end{aligned}$$

$$\begin{aligned} (10) \quad (4a-8b)(4a+8b) &= (4a)^2 - (8b)^2 \\ &= 16a^2 - 64b^2 \end{aligned}$$

$$\begin{aligned} (12) \quad (x+3)^2 + (x-12)(x+3) \\ &= (x^2 + 6x + 9) + (x^2 - 9x - 36) \\ &= x^2 + 6x + 9 + x^2 - 9x - 36 \\ &= 2x^2 - 3x - 27 \end{aligned}$$

$$\begin{aligned} (14) \quad 6x^2 - 9 &= 3 \times 2x^2 - 3 \times 3 \\ &= 3(2x^2 - 3) \end{aligned}$$

$$(16) \quad x^2 + 5x + 6 = (x+2)(x+3)$$

$$(18) \quad x^2 - 6x + 7 = 0$$

より  $x^2 - 6x = -7$

両辺に  $3^2$  をたすと

$$x^2 - 6x + 3^2 = -7 + 3^2$$

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

$$x-3 = \pm\sqrt{2} \quad \text{よって} \quad x = 3 \pm \sqrt{2}$$

$$(20) \quad x^2 = x$$

を整理すると  $x^2 - x = 0$

左辺を因数分解すると  $x(x-1) = 0$

よって  $x=0$  または  $x-1=0$

したがって  $x=0, 1$