第1回 答え

1。 (1) 係数：$8ay^3$，次数：2

(2) 係数：$8ax^2$，次数：3

(3) 係数：$8a$，次数：5

2。 $-x^2-2y^2+2xy$，2次式

3。 (1) 2次式，定数項：y^3+y-5

(2) 3次式，定数項：$5x^2-5$

(3) 4次式，定数項：-5

4。 x：$x^3+(-3y+4)x+y^3-5y+1$

y：$y^3+(-3x-5)y+x^3+4x+1$

5。 $A+B=5x^2+5x$，$A-B=(1-3x+4x^2)-(x^2+8x-1)$

$=3x^2-11x+2$ //

6。 $2A+B-(4A-3B)$

$=-2A+4B$

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

$=8x^2+18$ //

7. (1) $(-3xy^2)^2 \times (-2x^2y)^3$

$= 9x^2y^4 \times (-8)x^6y^3$

$= -72x^8y^7$ //

(2) $12a^2b\left(\frac{a^2}{3} - \frac{ab}{6} - \frac{b^2}{4}\right)$

$= 4a^4b - 2a^3b^2 - 3a^2b^3$ //

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

$= -8x^2y^2 + 12y^3$ //

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

$= 6xy - 2x + 9y - 3$ //

(5) $(t-1)(t^2+t)$

$= t^3 - t$ //

(6) $(2x+1)(3x-4)$

$= 6x^2 - 5x - 4$ //

(7) $(x^2+3xy)(y^2-2xy)$

$= x^2y^2 + 3xy^3 - 2x^3y - 6x^2y^2$

$= -5x^2y^2 + 3xy^3 - 2x^3y$ //

8. (1) $(x+2)^2 = x^2+4x+4$ //

(2) $(4x-3y)^2 = 16x^2-24xy+9y^2$ //

(3) $(x-3)(x+3) = x^2-9$ //

(4) $(3a-4b)(3a+4b) = 9a^2-16b^2$ //

(5) $(x-4)(x-5) = x^2-9x+20$ //

(6) $(x+4)(x-5) = x^2-x-20$ //

(7) $(x^2-y^2)(x^2+y^2) = x^4-y^4$ //

(8) $(x-3y)(x+4y) = x^2+xy-12y^2$ //

(9) $(a-5b)(a+2b) = a^2-3ab-10b^2$ //

(10) $(4x+3y)(2x+5y) = 8x^2+26xy+15y^2$ //

(11) $(6x-5y)(3x+2y) = 18x^2-3xy-10y^2$ //

(12) $(x-3y+4)^2 = x^2+9y^2+16+8x-24y-6xy$ //

(13) $(x^2-2x+3)^2 = x^4-4x^3+10x^2-12x+9$ //

(14) $(x+3)^2(x-3)^2 = (x^2-9)^2 = x^4-18x^2+81$ //

(15) $(x^2+4)(x+2)(x-2) = (x^2+4)(x^2-4) = x^4-16$ //

(16) $(x^2-2xy+4y^2)(x^2+2xy+4y^2) = (x^2+4y^2)^2-4x^2y^2$

$= x^4+4x^2y^2+16y^4$ //

Qe (1) $m^2ab - ma^2b = mab(m-a)$ //

(2) $2a(a-3b) - b(3b-a) = (a-3b)(2a+b)$ //

(3) $x^2 - x + \frac{1}{4} = \frac{1}{4}(4x^2-4x+1) = \frac{1}{4}(2x-1)^2$ // $\left(x-\frac{1}{2}\right)^2$ も可

(4) $9a^2 - 12ab + 4b^2 = (3a-2b)^2$ //

(5) $9x^2 - 25 = (3x-5)(3x+5)$ //

(6) $18x^2 - 32y^2 = 2(3x-4y)(3x+4y)$ //

(7) $x^2 - (y-1)^2 = (x-y+1)(x+y-1)$ //

(8) $x^2 + 21x + 20 = (x+1)(x+20)$ //

(9) $x^2 + 9x + 20 = (x+4)(x+5)$ //

(10) $x^2 - 8x - 20 = (x+2)(x-10)$ //

(11) $x^2 + 4x + 3 = (x+1)(x+3)$ //

(12) $x^2 + 8x - 9 = (x-1)(x+9)$ //

(13) $x^2 - 17xy - 18y^2 = (x-18y)(x+y)$ //

(14) $2x^2 + 13x + 6 = (2x+1)(x+6)$ //

(15) $2x^2 - x - 6 = (2x+3)(x-2)$ //

(16) $2x^2 - 7xy + 6y^2 = (2x-3y)(x-2y)$ //

9. (17) $8a^2 - 14ab + 3b^2 = (4a-b)(2a-3b)$ //

(18) $x^4 - 3x^2 - 28 = (x^2-7)(x^2+4)$ //

(19) $x^4 - 16 = (x^2-4)(x^2+4) = (x+2)(x-2)(x^2+4)$ //

10. (1) $\frac{3}{20} = \frac{15}{100} = 0.15$ //

(2) $\frac{5}{33} = 0.\dot{1}\dot{5}$ //

$$\begin{array}{r} 0.15 \\ 33\overline{)\,50} \\ 33 \\ \hline 170 \\ 165 \\ \hline 5 \end{array}$$

11. (1) $-1.24 = -\frac{124}{100} = -\frac{31}{25}$ //

(2) $x = 0.\dot{2}3\dot{4}$ とおく。

$1000x - x = 234$

$\therefore x = \frac{234}{999} = \frac{26}{111}$ //

$$\begin{array}{r} 26 \\ 9\overline{)\,234} \\ 18 \\ \hline 54 \end{array}$$

(3) $x = 0.14\dot{6}$ とおく。

$1000x - 10x = 146.\dot{4}\dot{6} - 1.\dot{4}\dot{6} = 145$

$\therefore x = \frac{145}{990} = \frac{29}{198}$ //

$145 \div 5 = (150-5) \div 5$

$= 29$

$990 = 9 \times 11 \times 10$

$9 \times 11 \times 2 = 18 \times 11$

$= 180 + 18$

$= 198$

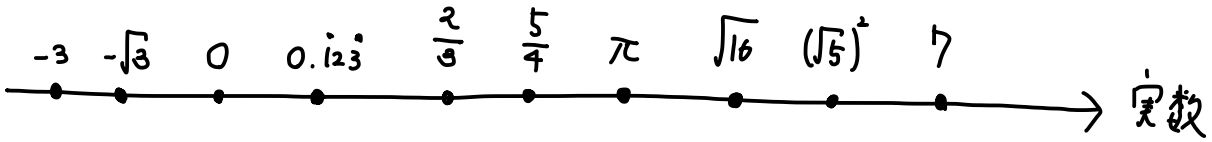
12。 (1) 真の命題

(2) 偽の命題，反例：$\sqrt{2}+(-\sqrt{2})=0$

(3) 偽の命題，反例：$0\times\sqrt{2}=0$

(4) 偽の命題，反例：$\sqrt{2}\times\sqrt{2}=2$

13。



(1) $\sqrt{16}$，$(\sqrt{5})^2$，7

(2) -3，0，$\sqrt{16}$，$(\sqrt{5})^2$，7

(3) -3，0，$0.\dot{1}2\dot{3}$，$\frac{2}{3}$，$\frac{5}{4}$，$\sqrt{16}$，$(\sqrt{5})^2$，7

(4) $-\sqrt{3}$，π

(5) $\frac{5}{4}$

(6) $\frac{2}{3}$，$0.\dot{1}2\dot{3}$

14。 整数部分：2，小数部分：$\sqrt{5}-2$

15。 (1) 6

(2) $2-\sqrt{2}$

16. (1) $10-(-2)=12$ //

(2) $|-32-(-17)|=15$ //

17. (1) ± 10

(2) $\pm\sqrt{10}$

(3) ± 1

(4) 0

(5) 7

(6) 7

(7) 7

(8) 7

18. (1) $2\sqrt{5}\times 3\sqrt{20}=6\cdot 5\sqrt{4}=60$ //

(2) $\dfrac{\sqrt{50}}{\sqrt{8}}=\dfrac{\sqrt{25}}{\sqrt{4}}=\dfrac{5}{2}$ //

(3) $\sqrt{20}+\sqrt{125}-\sqrt{80}$

$=2\sqrt{5}+5\sqrt{5}-4\sqrt{5}$

$=3\sqrt{5}$ //

(4) $\sqrt{200}-3\sqrt{18}+\sqrt{50}$

$=10\sqrt{2}-9\sqrt{2}+5\sqrt{2}$

$=6\sqrt{2}$ //

18。 (5) $\sqrt{5}(\sqrt{40}-4\sqrt{5})$

$= \sqrt{200} - 4\cdot 5$

$= 10\sqrt{2} - 20$ //

(6) $(\sqrt{5}+\sqrt{2})^2 = 7+2\sqrt{10}$ //

(7) $(\sqrt{5}-3)(\sqrt{5}+3) = -4$ //

(8) $(4\sqrt{5}-2\sqrt{7})(3\sqrt{5}+4\sqrt{7})$

$= 12\cdot 5 - 8\cdot 7 + (16-6)\sqrt{35}$

$= 4 + 10\sqrt{35}$ //

19。 (1) $\frac{14}{3\sqrt{7}} = \frac{2\sqrt{7}}{3}$ //

(2) $\frac{1+\sqrt{2}}{1-\sqrt{2}} = \frac{(1+\sqrt{2})^2}{(1-\sqrt{2})(1+\sqrt{2})} = \frac{3+2\sqrt{2}}{-1} = -3-2\sqrt{2}$ //

20。 $8x + 100 \leq 3000$

21。 (1) $a+4 < b+4$

(2) $a-5 < b-5$

(3) $7a < 7b$

(4) $-\frac{a}{5} > -\frac{b}{5}$

(5) $3-4a > 3-4b$

22。 (1) $x=5, 6$

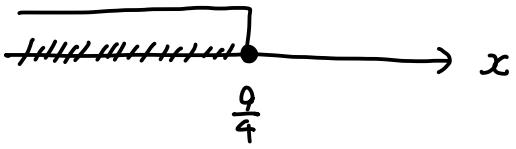
(2) $x=-2, 3$

(3) $x=3, 5, 6$

23。 (1) $3x-2 \leq 7-x$

$4x \leq 9$

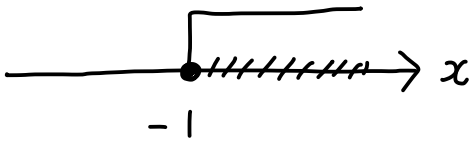
$x \leq \frac{9}{4}$ //



(2) $2(x-2) \geq -3(x+3)$

$5x \geq -5$

$x \geq -1$ //

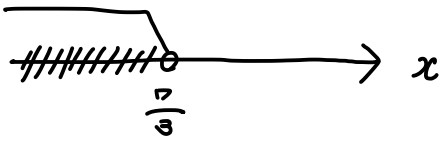


(3) $\frac{x-3}{4} + \frac{5}{2} > x$

$x-3+10 > 4x$

$-3x > -7$

$x < \frac{7}{3}$

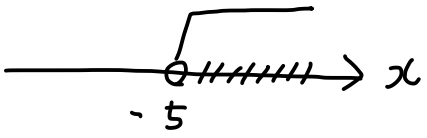


RB₀ (4) $0.2x - 1.5 < 0.5x$

$2x - 15 < 5x$

$-3x < 15$

$x > -5$



(5) $\sqrt{3}x - 1 < \sqrt{5}(x - \sqrt{3})$

$(\sqrt{3} - \sqrt{5})x < -\sqrt{15} + 1$

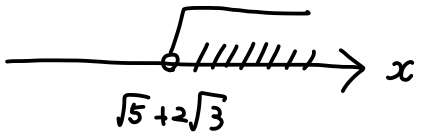
$x > \dfrac{-\sqrt{15} + 1}{\sqrt{3} - \sqrt{5}}$

$x > \dfrac{(-\sqrt{15}+1)(\sqrt{3}+\sqrt{5})}{3-5}$

$x > -\dfrac{1}{2}\{-3\sqrt{5} - 5\sqrt{3} + \sqrt{3} + \sqrt{5}\}$

$x > -\dfrac{1}{2}\{-2\sqrt{5} - 4\sqrt{3}\}$

$x > \sqrt{5} + 2\sqrt{3}$



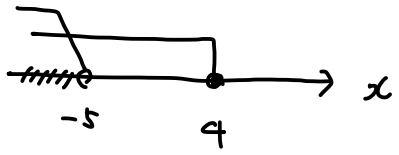
RH₀ (7) $\begin{cases} x+1 < 4 \\ x-2 \geq -7 \end{cases}$

$\begin{cases} x < 3 \\ x \geq -5 \end{cases}$

$\therefore -5 \leq x < 3$ //

24. (2) $\begin{cases} x-1 \leq 3 \\ x+1 < -4 \end{cases}$

$\begin{cases} x \leq 4 \\ x < -5 \end{cases}$

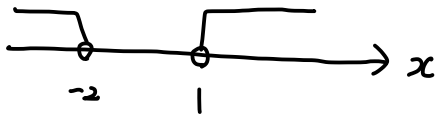


$\therefore x < -5$ //

(3) $\begin{cases} 2x-1 > 1 \\ 7 < 1-3x \end{cases}$

$\begin{cases} 2x > 2 \\ 3x < -6 \end{cases}$

$\begin{cases} x > 1 \\ x < -2 \end{cases}$



解なし //

(4) $\begin{cases} x+2 < 3x-8 \\ 10x-5(x-2) > 8(x-2)+5 \end{cases}$

$\begin{cases} -2x < -10 \\ -3x > -10-16+5 \end{cases}$

$\begin{cases} x > 5 \\ x < 7 \end{cases}$

$\therefore 5 < x < 7$ //

24. (5) $2x-3<3x-2<x+4$

$$\begin{cases} 2x-3<3x-2 \\ 3x-2<x+4 \end{cases}$$

$$\begin{cases} -x<1 \\ 2x<6 \end{cases}$$

$$\begin{cases} x>-1 \\ x<3 \end{cases}$$

$\therefore -1<x<3$ //

(6) $5-\frac{x}{2} \le 2x \le \frac{x+10}{3}$

$$\begin{cases} 5-\frac{x}{2} \le 2x \\ 2x \le \frac{x+10}{3} \end{cases}$$

$$\begin{cases} 10-x \le 4x \\ 6x \le x+10 \end{cases}$$

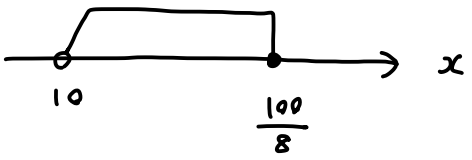
$$\begin{cases} -5x \le -10 \\ 5x \le 10 \end{cases}$$

$$\begin{cases} x \ge 2 \\ x \le 2 \end{cases}$$

$\therefore x=2$ //

25. $\begin{cases} 8x \leq 100 \\ 20x > 200 \end{cases}$

$\begin{cases} x \leq \frac{100}{8} \\ x > 10 \end{cases}$



$100 = 80 + 16 + 4$

$\approx 12, \cdots$

$\therefore x = 11, 12$ //

26. $|x| = 6$

$x = \pm 6$ //

27. (1) $|x| < 6$

$-6 < x < 6$ //

(2) $|x| \geq 6$

$x \leq -6, 6 \leq x$ //

28. $|3x+1| = 5$

$3x+1 = -5$ または $3x+1 = 5$

$3x = -6$ または $3x = 4$

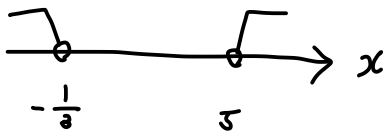
$\therefore x = -2, \frac{4}{3}$ //

練習 (1) $|3x-7| > 8$

$3x-7 < -8$ または $8 < 3x-7$

$3x < -1$ または $-3x < -15$

$x < -\frac{1}{3}$ または $x > 5$ //



(2) $|4x+7| \leq 6$

$-6 \leq 4x+7 \leq 6$

$-13 \leq 4x \leq -1$

$-\frac{13}{4} \leq x \leq -\frac{1}{4}$ //