

中2数学 対(4)

1 (1) $-3x^2$ $+4x$ -5 $\rightarrow -3x^2, 4x, -5$

(2) ① $-6a$ ② $\frac{1}{2}abc$ ③ $2x^2y - 3xy + y$ ④ $a+b+c+d+e$
1次 3次 3次 1次

(3) $7x+5$ $+ 3x^2$ $\rightarrow 7x-8x$ $-9x$ $+ 6xy+2y$ $+ x^2-6x+1$
 ① 単項式 1, 1

② $4x$ の同類項 $7x, -9x, -6x$

(4) $n \in$ 整数 とする

① 偶数 $2n$ ② 奇数 $\frac{2n+1}{(2n-1)}$ ③ $7x$ 割ると 5 余る数
 $7n+5$ $(7n-2)$

2 (1) $2x - 4y + 5x$
 $= 7x - 4y$

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

(5) $3(x-3y)$ $(-5)(x-2y)$
 $= 3x - 9y - 5x + 10y$
 $= -2x + y$

(2) $-3x^2 + 7x - 2x - 8x^2$
 $= -11x^2 + 5x$

(4) $5(a+3b)$ $+ 4(a-3b)$
 $= 5a + 10b + 4a - 10b$
 $= 9a - 2b$

(6) $(12a + 4b) \div \frac{1}{2}$
 $= \frac{12a}{\frac{1}{2}} + \frac{4b}{\frac{1}{2}}$
 $= 6a + 2b$

$$\begin{aligned}
 2(7) & \left(-\frac{1}{7}a\right) \div \left(-\frac{8}{7}a\right) \\
 & = -\frac{\cancel{a}}{\cancel{7}} \times \left(-\frac{\cancel{7}}{\cancel{8}a}\right) \\
 & = \underline{\underline{+\frac{1}{8}}}
 \end{aligned}$$

$$\begin{aligned}
 (8) & \frac{3}{4}(x+6y) + \frac{1}{2}(4x+y) \\
 & = \frac{3}{4}(x+6y) + \frac{2}{4}(4x+y) \quad \left[\begin{array}{l} \text{4に} \\ \text{分子を} \\ \text{2倍する} \\ \text{おのれ} \end{array} \right] \\
 & = \frac{3(x+6y) + 2(4x+y)}{4} \\
 & = \frac{3x+18y+8x+2y}{4} \\
 & = \frac{11x+20y}{4} \quad \left(\frac{11}{4}x+5y\right)
 \end{aligned}$$

3. (1) ① $x=6, y=-\frac{1}{2}$ を代入

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

$$= \underline{5x+3y} - \underline{4x-y}$$

$$= x-4y \quad \leftarrow \text{計算}$$

$$= 5 \times 6 - 4 \times \left(-\frac{1}{2}\right)$$

$$= 30 + 2$$

$$= \underline{\underline{32}}$$

② $\frac{1}{x} + \frac{1}{y} = 2$ を代入 $\frac{4x+2xy+4y}{x+y}$ の値

$$\frac{1}{x} + \frac{1}{y} = 2 \quad \left[\begin{array}{l} \text{通分} \\ \text{両辺} \\ \text{に} \end{array} \right]$$

$$\frac{y}{xy} + \frac{x}{xy} = 2$$

$$\frac{x+y}{xy} = 2 \quad \left[\begin{array}{l} \text{両辺} \\ \text{に} \end{array} \right]$$

$$x+y = 2xy$$

これを式に代入

$$\frac{4(x+y) + 2xy}{x+y} = \frac{4 \times 2xy + 2xy}{2xy}$$

$$= \frac{8xy + 2xy}{2xy}$$

$$= \frac{\cancel{5} \times \cancel{xy}}{\cancel{2} \times \cancel{xy}}$$

$$= \underline{\underline{5}}$$

3 (2) ① $4x - 2y = 10$

$$4x = 10 + 2y$$

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

[x]
 移項
 兩邊×4
 370數
 約分!!

② $a = \frac{1}{3}(3b - c)$ [b]

$$5a = 3b - c$$

$$3b - c = 5a$$

$$3b = 5a + c$$

$$b = \frac{5a + c}{3}$$

兩邊
 ×5
 左右
 ×3消元
 移項
 兩邊
 × $\frac{1}{3}$

4 (1) $x^a y^b \cdot x^c y^3 = (xy)^5$ $a < b < c$ (自然數)

$x^{(a+c)} y^{(b+3)} = x^5 y^5$

指數定律適用

$$\begin{cases} a+c=5 \\ b+3=5 \end{cases} \rightarrow b=2$$

$a+c=5$ 5.1

(a, c)

(1, 4)

(2, 3)

(3, 2)

(4, 1)

$a < b = 2$

$$\begin{cases} a=1 \\ b=2 \\ c=4 \end{cases}$$

(2) ① 圓周 $2\pi r$

② $2\pi \times 3r = 6\pi r$ $6\pi r \div 2\pi r = 3$ 倍

③ 圓面積 πr^2

④ 半徑3倍 $\pi (3r)^2 = 9\pi r^2$ $9\pi r^2 \div \pi r^2 = 9$ 倍

★ 圓形 半徑(邊長) 周長 面積 體積

$$\begin{cases} 2 \text{ 倍 } a \text{ 倍} & 2 \text{ 倍}, 2^2 = 4 \text{ 倍}, 2^3 = 8 \text{ 倍} \\ 3 \text{ 倍 } a \text{ 倍} & 3 \text{ 倍}, 3^2 = 9 \text{ 倍}, 3^3 = 27 \text{ 倍} \\ a \text{ 倍 } a \text{ 倍} & a \text{ 倍}, a^2 \text{ 倍}, a^3 \text{ 倍} \end{cases}$$

4 (3)

$$\begin{aligned} \text{AB 爲軸 } V_{AB} &= \pi \times (4a)^2 \times 3a \times \frac{1}{2} \\ &= 16\pi a^3 \end{aligned}$$

$$\begin{aligned} \text{BC 爲軸 } V_{BC} &= \pi \times (3a)^2 \times 4a \times \frac{1}{3} \\ &= 12\pi a^3 \end{aligned}$$

$$\begin{aligned} V_{AB} : V_{BC} &= 16\pi a^3 : 12\pi a^3 \\ &= 16 : 12 \\ &= 4 : 3 \end{aligned}$$

(4) 722 mm = r cm 爲底 Bo 高是 2r cm

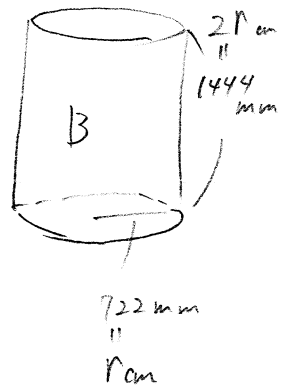
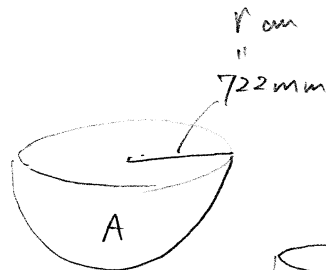
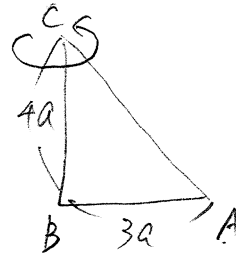
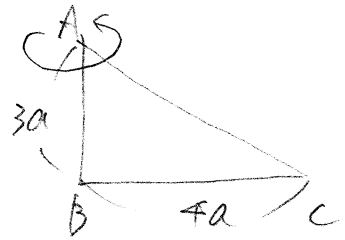
$$V_A = \frac{4}{3}\pi r^3 \times \frac{1}{2} = \frac{2}{3}\pi r^3 \text{ (cm}^3\text{)}$$

$$V_B = \pi r^2 \times 2r = 2\pi r^3 \text{ (cm}^3\text{)}$$

$$V_B : V_A = 2\pi r^3 : \frac{2}{3}\pi r^3$$

$$= \frac{2\pi r^3}{1} \times \frac{3}{2\pi r^3}$$

$$= 3 \quad \underline{A \quad 3 \text{ 杯}}$$



球公式

$$\text{體積} = \frac{4}{3}\pi r^3$$

$$\text{表面積} = 4\pi r^2$$

4 (b)

① $a \in \text{整数}$ とする。

$$6a + 5$$

① $\wedge$ 自然数 に注意!
(-1 は使えない!)

② $m, n \in \text{整数}$ とする。

B グループの数は $\frac{6m+2}{1}$

C グループの数は $\frac{6n+3}{1}$ と表される

それらの和は

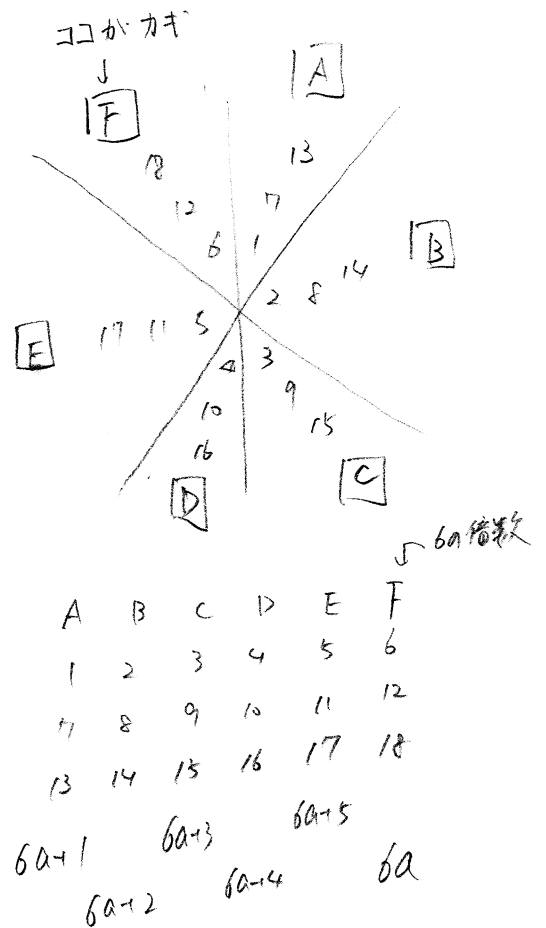
$$(6m+2) + (6n+3)$$

$$= 6m + 6n + 5$$

$$= \frac{6(m+n) + 5}{1}$$

$\rightarrow$ $m+n$ は整数な a である。 $\therefore$ 答え $\downarrow$

2つの数の和は E グループにある。



↓ (E グループの数は $6a+5$ と表される)

(6) 省略 (模範解答)

5 (1) $\begin{cases} 3x-4=5 \\ a-2b=5 \end{cases} \rightarrow x^2+y^2=36$
 1元1次方程式 2元1次方程式 2元2次方程式.

I. $m=n-3$
 2元1次方程式.

A. I. I

(2) $\begin{cases} x+y=4 \\ 3x-y=10 \end{cases}$

① $x+y=4$

x	1	2	(3)	4
y	3	2	(1)	0

↑ 共通

② $3x-y=10$

x	1	2	(3)	4
y	7	4	(1)	-2

③ ①と②を共に満たしているのは

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

(3) 1次の連立方程式で $x=1, y=2$ が解であるもの.

$\begin{cases} x+y=3 & \circ \\ x+2y=4 & \times \\ (1+4=5 & \times) \end{cases}$

$\begin{cases} x-y=3 & \circ \\ 3x+2y=1 & \times \\ (3+4=7 & \times) \end{cases}$

$\begin{cases} x-y=-1 & \circ \\ 2x+y=2 & \times \\ (2+2=4 & \times) \end{cases}$

④ $\begin{cases} x-y=-1 & \circ \\ x+3y=7 & \circ \\ (1+6=7 & \circ) \end{cases}$

A. I

$$6(1) \begin{cases} x + y = 5 \dots \textcircled{1} \\ 2x - y = 4 \dots \textcircled{2} \end{cases}$$

$$\begin{aligned} \textcircled{1} + \textcircled{2} & \text{ gives } \\ x + y &= 5 \\ -) 2x - y &= 4 \\ \hline 3x &= 9 \\ x &= 3 \end{aligned}$$

$$\begin{aligned} x &= 3 \text{ in } \textcircled{1} \text{ gives } \\ 3 + y &= 5 \\ y &= 2 \end{aligned}$$

$$\begin{cases} x = 3 \\ y = 2 \end{cases}$$

$$(2) \begin{cases} -x + 3y = 20 \dots \textcircled{1} \\ 5x + y = -4 \dots \textcircled{2} \end{cases}$$

$$\begin{aligned} \textcircled{1} \times 5 + \textcircled{2} & \text{ gives } \\ -5x + 15y &= 100 \\ + 5x + y &= -4 \\ \hline 16y &= 96 \\ y &= 6 \end{aligned}$$

$$\begin{aligned} y &= 6 \text{ in } \textcircled{1} \text{ gives } \\ -x + 3(6) &= 20 \\ -x + 18 &= 20 \\ -x &= 2 \\ x &= -2 \end{aligned}$$

$$\begin{cases} x = -2 \\ y = 6 \end{cases}$$

$$(3) \begin{cases} 4x - 7y = 9 \dots \textcircled{1} \\ 6x - 8y = -4 \dots \textcircled{2} \end{cases}$$

$$\begin{aligned} \textcircled{1} \times 3 - \textcircled{2} \times 2 & \text{ gives } \\ 12x - 21y &= 27 \\ -) 12x - 16y &= -8 \\ \hline -5y &= 35 \\ y &= -7 \end{aligned}$$

$$\begin{aligned} y &= -7 \text{ in } \textcircled{1} \text{ gives } \\ 4x + 49 &= 9 \\ 4x &= -40 \\ x &= -10 \end{aligned}$$

$$\begin{cases} x = -10 \\ y = -7 \end{cases}$$

$$(4) \begin{cases} y = x + 8 \dots \textcircled{1} \\ 2x + 3y = -6 \dots \textcircled{2} \end{cases}$$

$$\begin{aligned} \textcircled{1} \text{ in } \textcircled{2} & \text{ gives } \\ 2x + 3(x + 8) &= -6 \\ 2x + 3x + 24 &= -6 \\ 5x &= -30 \\ x &= -6 \end{aligned}$$

$$\begin{aligned} x &= -6 \text{ in } \textcircled{1} \text{ gives } \\ y &= -6 + 8 \\ y &= 2 \end{aligned}$$

$$\begin{cases} x = -6 \\ y = 2 \end{cases}$$