



中学2年数学講座

第2章 連立方程式

6. 分数・小数を含む連立方程式

基本問題



講師：まことと和貴

係数に小数を含む連立方程式

$$\text{例) } \begin{cases} 0.2x + 0.3y = 0.1 & \text{①} \\ 0.05x - 0.02y = 0.31 & \text{②} \end{cases}$$

係数に小数を含む連立方程式

$$\text{例) } \begin{cases} 0.2x + 0.3y = 0.1 & \text{①} \\ 0.05x - 0.02y = 0.31 & \text{②} \end{cases}$$

係数を整数にする \Rightarrow $\times 10$ 、 $\times 100$

$$\text{①} \times 10 \quad \text{②} \times 100$$

$$2x + 3y = 1 \quad \text{①}'$$

$$5x - 2y = 31 \quad \text{②}'$$

$$\text{①}' \times 2 + \text{②}' \times 3$$

$$19x = 95 \quad x = 5$$

$x = 5$ を①' に代入

$$10 + 3y = 1 \quad y = -3$$

$$(x, y) = (5, -3)$$

$$\begin{array}{r} 4x + 6y = 2 \\ +) 15x - 6y = 93 \\ \hline 19x = 95 \end{array}$$

係数に分数を含む連立方程式

例)
$$\begin{cases} \frac{1}{3}x + \frac{1}{2}y = 1 & \text{①} \\ 5x + 4y = 1 & \text{②} \end{cases}$$

係数に分数を含む連立方程式

$$\text{例) } \begin{cases} \frac{1}{3}x + \frac{1}{2}y = 1 & \text{①} \\ 5x + 4y = 1 & \text{②} \end{cases}$$

係数を整数にする \Rightarrow 最小公倍数をかける。

$$\text{①} \times 6$$

$$2x + 3y = 6 \quad \text{①}'$$

$$5x + 4y = 1 \quad \text{②}$$

$$\text{①}' \times 5 - \text{②} \times 2$$

$$7y = 28 \quad y = 4$$

$y = 4$ を①' に代入

$$2x + 12 = 6 \quad x = -3$$

$$(x, y) = (-3, 4)$$

基本問題 次の連立方程式を解きなさい。

$$\begin{array}{l} (1) \begin{cases} 0.2x - 0.3y = 1.3 \\ 0.1x = -0.3y - 0.7 \end{cases} \\ (2) \begin{cases} 0.5x + 1.2y = 7 \\ 0.3x - 1.5y = -6.9 \end{cases} \\ (3) \begin{cases} 5x + 3y = 1 \\ 0.25x - 0.13y = -0.51 \end{cases} \\ (4) \begin{cases} \frac{1}{2}x - \frac{2}{3}y = \frac{1}{3} \\ 5x + 2y = 12 \end{cases} \end{array} \quad \begin{array}{l} (5) \begin{cases} \frac{1}{4}x + \frac{1}{2}y = 5 \\ \frac{1}{6}x - \frac{1}{2}y = -10 \end{cases} \\ (6) \begin{cases} \frac{2x + 5y}{4} = 2 \\ \frac{x - y}{3} - 1 = -2 \end{cases} \end{array}$$

$$(1) \begin{cases} 0.2x - 0.3y = 1.3 & \textcircled{1} \\ 0.1x = -0.3y - 0.7 & \textcircled{2} \end{cases}$$

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$$\textcircled{1} \times 10, \textcircled{2} \times 10$$

$$2x - 3y = 13 \quad \textcircled{1}'$$

$$x = -3y - 7 \Rightarrow x + 3y = -7 \quad \textcircled{2}'$$

$$\textcircled{1}' + \textcircled{2}'$$

$$3x = 6 \quad x = 2$$

$x = 2$ を $\textcircled{2}'$ に代入

$$2 + 3y = -7 \quad y = -3$$

$$(x, y) = (2, -3)$$

$$(2) \begin{cases} 0.5x + 1.2y = 7 & \textcircled{1} \\ 0.3x - 1.5y = -6.9 & \textcircled{2} \end{cases}$$

$$(2) \begin{cases} 0.5x + 1.2y = 7 & \textcircled{1} \\ 0.3x - 1.5y = -6.9 & \textcircled{2} \end{cases}$$

$$\textcircled{1} \times 10, \textcircled{2} \times 10$$

$$5x + 12y = 70 \quad \textcircled{1}'$$

$$3x - 15y = -69 \quad \textcircled{2}'$$

$$\textcircled{1}' \times 3 - \textcircled{2}' \times 5$$

$$111y = 555 \quad y = 5$$

$$y = 5 \text{ を } \textcircled{1}' \text{ に代入}$$

$$5x + 60 = 70 \quad x = 2$$

$$(x, y) = (2, 5)$$

$$(3) \begin{cases} 5x+3y=1 & \textcircled{1} \\ 0.25x-0.13y=-0.51 & \textcircled{2} \end{cases}$$

$$(3) \begin{cases} 5x+3y=1 & \textcircled{1} \\ 0.25x-0.13y=-0.51 & \textcircled{2} \end{cases}$$

$$\textcircled{2} \times 100 \quad \textcircled{1} \times 5$$

$$25x-13y=-51 \quad \textcircled{2}'$$

$$25x+15y=5 \quad \textcircled{1}'$$

$$\textcircled{2}' - \textcircled{1}'$$

$$-28y=-56 \quad y=2$$

$y=2$ を $\textcircled{1}$ に代入

$$5x+6=1 \quad x=-1$$

$$(x, y) = (-1, 2)$$

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

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

$$\textcircled{1} \times 6 \quad \textcircled{2} \times 2$$

$$3x - 4y = 2 \quad \textcircled{1}'$$

$$10x + 4y = 24 \quad \textcircled{2}'$$

$$\textcircled{1}' + \textcircled{2}'$$

$$13x = 26 \quad x = 2$$

$x=2$ を $\textcircled{1}'$ に代入

$$6 - 4y = 2$$

$$-4y = -4 \quad y = 1$$

$$(x, y) = (2, 1)$$

$$(5) \begin{cases} \frac{1}{4}x + \frac{1}{2}y = 5 & \textcircled{1} \\ \frac{1}{6}x - \frac{1}{2}y = -10 & \textcircled{2} \end{cases}$$

$$(5) \begin{cases} \frac{1}{4}x + \frac{1}{2}y = 5 & \textcircled{1} \\ \frac{1}{6}x - \frac{1}{2}y = -10 & \textcircled{2} \end{cases}$$

$$\textcircled{1} \times 4 \quad \textcircled{2} \times 6$$

$$x + 2y = 20 \quad \textcircled{1}'$$

$$x - 3y = -60 \quad \textcircled{2}'$$

$$\textcircled{1}' - \textcircled{2}'$$

$$5y = 80 \quad y = 16$$

$y = 16$ を $\textcircled{1}'$ に代入

$$x + 32 = 20 \quad x = -12$$

$$(x, y) = (-12, 16)$$

$$(6) \begin{cases} \frac{2x+5y}{4} = 2 & \textcircled{1} \\ \frac{x-y}{3} - 1 = -2 & \textcircled{2} \end{cases}$$

$$(6) \begin{cases} \frac{2x+5y}{4} = 2 & \textcircled{1} \\ \frac{x-y}{3} - 1 = -2 & \textcircled{2} \end{cases}$$

$$\textcircled{1} \times 4 \quad \textcircled{2} \times 6$$

$$2x+5y=8 \quad \textcircled{1}'$$

$$2(x-y) - 6 = -12$$

$$\Rightarrow 2x-2y = -6 \quad \textcircled{2}'$$

$$\textcircled{1}' - \textcircled{2}'$$

$$(2x+5y) - (2x-2y) = 8 - (-6)$$

$$7y=14 \quad y=2$$

$y=2$ を $\textcircled{1}'$ に代入

$$2x+10=8$$

$$2x=-2 \quad x=-1$$

$$(x, y) = (-1, 2)$$

応用問題 次の連立方程式を解きなさい。

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

$$(4) \begin{cases} -0.1x + 0.7(x+y) = 2 \\ 0.6(x-y) - 1.3y = -3.2 \end{cases}$$

$$(5) \begin{cases} 0.03(4x+9y) = -0.15 \\ 0.27x - 0.12y = 0.39 \end{cases}$$

$$(2) \begin{cases} \frac{x}{4} - \frac{y}{3} = -\frac{1}{2} \\ 0.4x + 0.3y = 0.2 \end{cases}$$

$$(3) \begin{cases} 2\left(x + \frac{1}{6}\right) + 3\left(y - \frac{1}{7}\right) = 8 \\ -2\left(y - \frac{1}{7}\right) + 3\left(x + \frac{1}{6}\right) = -1 \end{cases}$$