

すきプリ 中学数学

連立方程式の問題【分数】

もくじ

連立方程式の問題【分数 1】

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連立方程式の問題【分数まとめ】

問題

分数を含む連立方程式を解いてみましょう。

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

$$\begin{cases} -x + y = -17 \\ -\frac{3}{38}x + \frac{1}{19}y = -1 \end{cases}$$

$$\begin{cases} \frac{1}{2}x + \frac{2}{3}y = 1 & \dots\dots\textcircled{1} \\ x + y = 4 & \dots\dots\textcircled{2} \end{cases}$$

①の両辺に6をかけると

$$\begin{aligned} \left(\frac{1}{2}x + \frac{2}{3}y\right) \times 6 &= 1 \times 6 \\ 3x + 4y &= 6 & \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{3} \quad 3x + 4y = 6$$

$$\textcircled{2} \times 3 \quad \begin{array}{r} -) 3x + 3y = 12 \\ \hline y = -6 \end{array}$$

$$y = -6$$

$y = -6$ を②に代入すると

$$x + y = 4$$

$$x + 1 \times (-6) = 4$$

$$x - 6 = 4$$

$$x = 10$$

答え $x = 10, y = -6$

$$\begin{cases} -x + y = -17 & \dots\dots\textcircled{1} \\ -\frac{3}{38}x + \frac{1}{19}y = -1 & \dots\dots\textcircled{2} \end{cases}$$

②の両辺に38をかけると

$$\begin{aligned} \left(-\frac{3}{38}x + \frac{1}{19}y\right) \times 38 &= -1 \times 38 \\ -3x + 2y &= -38 & \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{1} \times 2 \quad -2x + 2y = -34$$

$$\textcircled{3} \quad \begin{array}{r} -) -3x + 2y = -38 \\ \hline x = 4 \end{array}$$

$$x = 4$$

$x = 4$ を①に代入すると

$$-x + y = -17$$

$$-1 \times 4 + y = -17$$

$$-4 + y = -17$$

$$y = -13$$

答え $x = 4, y = -13$

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

$$\begin{cases} \frac{1}{2}x + \frac{1}{4}y = 2 \\ x + y = 2 \end{cases}$$

$$\begin{cases} -3x + y = -4 & \dots\dots ① \\ 2x - \frac{1}{2}y = 1 & \dots\dots ② \end{cases}$$

②の両辺に2をかけると

$$\begin{aligned} \left(2x - \frac{1}{2}y\right) \times 2 &= 1 \times 2 \\ 4x - y &= 2 & \dots\dots ③ \end{aligned}$$

$$① \quad -3x + y = -4$$

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

$$x = -2$$

$x = -2$ を①に代入すると

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

$$-3 \times (-2) + y = -4$$

$$6 + y = -4$$

$$y = -10$$

答え $x = -2, y = -10$

$$\begin{cases} \frac{1}{2}x + \frac{1}{4}y = 2 & \dots\dots ① \\ x + y = 2 & \dots\dots ② \end{cases}$$

①の両辺に4をかけると

$$\begin{aligned} \left(\frac{1}{2}x + \frac{1}{4}y\right) \times 4 &= 2 \times 4 \\ 2x + y &= 8 & \dots\dots ③ \end{aligned}$$

$$③ \quad 2x + y = 8$$

$$② \quad -) \quad \frac{x + y = 2}{x \quad \quad = 6}$$

$$x = 6$$

$x = 6$ を②に代入すると

$$x + y = 2$$

$$1 \times 6 + y = 2$$

$$6 + y = 2$$

$$y = -4$$

答え $x = 6, y = -4$

$$\begin{cases} 2x + 5y = -32 \\ \frac{1}{2}x + \frac{1}{4}y = -4 \end{cases}$$

$$\begin{cases} -7x + 8y = -4 \\ \frac{3}{2}x - 2y = -2 \end{cases}$$

$$\begin{cases} 2x + 5y = -32 & \dots\dots ① \\ \frac{1}{2}x + \frac{1}{4}y = -4 & \dots\dots ② \end{cases}$$

②の両辺に4をかけると

$$\begin{aligned} \left(\frac{1}{2}x + \frac{1}{4}y\right) \times 4 &= -4 \times 4 \\ 2x + y &= -16 & \dots\dots ③ \end{aligned}$$

$$① \quad 2x + 5y = -32$$

$$③ \quad \begin{array}{r} -) 2x + y = -16 \\ \hline 4y = -16 \end{array}$$

$$y = -4$$

$y = -4$ を③に代入すると

$$2x + y = -16$$

$$2x + 1 \times (-4) = -16$$

$$2x - 4 = -16$$

$$2x = -12$$

$$x = -6$$

答え $x = -6, y = -4$

$$\begin{cases} -7x + 8y = -4 & \dots\dots ① \\ \frac{3}{2}x - 2y = -2 & \dots\dots ② \end{cases}$$

②の両辺に2をかけると

$$\begin{aligned} \left(\frac{3}{2}x - 2y\right) \times 2 &= -2 \times 2 \\ 3x - 4y &= -4 & \dots\dots ③ \end{aligned}$$

$$① \quad -7x + 8y = -4$$

$$③ \times 2 \quad \begin{array}{r} +) 6x - 8y = -8 \\ \hline -x = -12 \end{array}$$

$$x = 12$$

$x = 12$ を③に代入すると

$$3x - 4y = -4$$

$$3 \times 12 - 4y = -4$$

$$36 - 4y = -4$$

$$-4y = -40$$

$$y = 10$$

答え $x = 12, y = 10$

$$\begin{cases} 2x + y = 2 \\ \frac{3}{38}x - \frac{1}{19}y = 1 \end{cases}$$

$$\begin{cases} -\frac{2}{3}x + y = -15 \\ -x + y = -19 \end{cases}$$

$$\begin{cases} 2x + y = 2 & \dots\dots ① \\ \frac{3}{38}x - \frac{1}{19}y = 1 & \dots\dots ② \end{cases}$$

②の両辺に38をかけると

$$\left(\frac{3}{38}x - \frac{1}{19}y\right) \times 38 = 1 \times 38$$

$$3x - 2y = 38 \quad \dots\dots ③$$

$$① \times 2 \quad 4x + 2y = 4$$

$$③ \quad \begin{array}{r} +) 3x - 2y = 38 \\ \hline 7x \quad \quad = 42 \end{array}$$

$$x = 6$$

$x = 6$ を①に代入すると

$$2x + y = 2$$

$$2 \times 6 + y = 2$$

$$12 + y = 2$$

$$y = -10$$

答え $x = 6, y = -10$

$$\begin{cases} -\frac{2}{3}x + y = -15 & \dots\dots ① \\ -x + y = -19 & \dots\dots ② \end{cases}$$

①の両辺に3をかけると

$$\left(-\frac{2}{3}x + y\right) \times 3 = -15 \times 3$$

$$-2x + 3y = -45 \quad \dots\dots ③$$

$$③ \quad -2x + 3y = -45$$

$$② \times 2 \quad \begin{array}{r} -) -2x + 2y = -38 \\ \hline y = -7 \end{array}$$

$$y = -7$$

$y = -7$ を②に代入すると

$$-x + y = -19$$

$$-x + 1 \times (-7) = -19$$

$$-x - 7 = -19$$

$$-x = -12$$

$$x = 12$$

答え $x = 12, y = -7$

$$\begin{cases} -\frac{2}{21}x + \frac{1}{14}y = 1 \\ -x - y = -7 \end{cases}$$

$$\begin{cases} -\frac{1}{5}x + \frac{1}{10}y = 1 \\ 4x - 5y = 4 \end{cases}$$

$$\begin{cases} -\frac{2}{21}x + \frac{1}{14}y = 1 & \dots\dots ① \\ -x - y = -7 & \dots\dots ② \end{cases}$$

①の両辺に42をかけると

$$\begin{aligned} \left(-\frac{2}{21}x + \frac{1}{14}y\right) \times 42 &= 1 \times 42 \\ -4x + 3y &= 42 & \dots\dots ③ \end{aligned}$$

$$③ \quad -4x + 3y = 42$$

$$② \times 3 \quad \begin{array}{r} +) -3x - 3y = -21 \\ \hline -7x \quad \quad = 21 \end{array}$$

$$x = -3$$

$x = -3$ を②に代入すると

$$\begin{aligned} -x - y &= -7 \\ -1 \times (-3) - y &= -7 \\ 3 - y &= -7 \\ -y &= -10 \\ y &= 10 \end{aligned}$$

答え $x = -3, y = 10$

$$\begin{cases} -\frac{1}{5}x + \frac{1}{10}y = 1 & \dots\dots ① \\ 4x - 5y = 4 & \dots\dots ② \end{cases}$$

①の両辺に10をかけると

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

$$③ \times 2 \quad -4x + 2y = 20$$

$$② \quad \begin{array}{r} +) 4x - 5y = 4 \\ \hline -3y = 24 \end{array}$$

$$y = -8$$

$y = -8$ を③に代入すると

$$\begin{aligned} -2x + y &= 10 \\ -2x + 1 \times (-8) &= 10 \\ -2x - 8 &= 10 \\ -2x &= 18 \\ x &= -9 \end{aligned}$$

答え $x = -9, y = -8$

$$\begin{cases} -\frac{1}{6}x + \frac{1}{3}y = 1 \\ x - 8y = -18 \end{cases}$$

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

$$\begin{cases} -\frac{1}{6}x + \frac{1}{3}y = 1 & \dots\dots ① \\ x - 8y = -18 & \dots\dots ② \end{cases}$$

①の両辺に6をかけると

$$\begin{aligned} \left(-\frac{1}{6}x + \frac{1}{3}y\right) \times 6 &= 1 \times 6 \\ -x + 2y &= 6 & \dots\dots ③ \end{aligned}$$

$$③ \quad -x + 2y = 6$$

$$② \quad \begin{array}{r} +) \quad x - 8y = -18 \\ \hline - 6y = -12 \end{array}$$

$$y = 2$$

$y = 2$ を③に代入すると

$$-x + 2y = 6$$

$$-x + 2 \times 2 = 6$$

$$-x + 4 = 6$$

$$-x = 2$$

$$x = -2$$

答え $x = -2, y = 2$

$$\begin{cases} -\frac{1}{2}x - \frac{3}{4}y = 2 & \dots\dots ① \\ x + y = -1 & \dots\dots ② \end{cases}$$

①の両辺に4をかけると

$$\begin{aligned} \left(-\frac{1}{2}x - \frac{3}{4}y\right) \times 4 &= 2 \times 4 \\ -2x - 3y &= 8 & \dots\dots ③ \end{aligned}$$

$$③ \quad -2x - 3y = 8$$

$$② \times 2 \quad \begin{array}{r} +) \quad 2x + 2y = -2 \\ \hline - y = 6 \end{array}$$

$$y = -6$$

$y = -6$ を②に代入すると

$$x + y = -1$$

$$x + 1 \times (-6) = -1$$

$$x - 6 = -1$$

$$x = 5$$

答え $x = 5, y = -6$

$$\begin{cases} -x + \frac{1}{2}y = -11 \\ -2x - y = -18 \end{cases}$$

$$\begin{cases} x + \frac{1}{2}y = -5 \\ 3x - y = 20 \end{cases}$$

$$\begin{cases} -x + \frac{1}{2}y = -11 & \dots\dots ① \\ -2x - y = -18 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} \left(-x + \frac{1}{2}y\right) \times 2 &= -11 \times 2 \\ -2x + y &= -22 & \dots\dots ③ \end{aligned}$$

$$③ \quad -2x + y = -22$$

$$② \quad \begin{array}{r} -) -2x - y = -18 \\ \underline{2x y = -4} \\ 2x + y = -4 \end{array}$$

$$y = -2$$

$y = -2$ を②に代入すると

$$\begin{aligned} -2x - y &= -18 \\ -2x - 1 \times (-2) &= -18 \\ -2x + 2 &= -18 \\ -2x &= -20 \\ x &= 10 \end{aligned}$$

答え $x = 10, y = -2$

$$\begin{cases} x + \frac{1}{2}y = -5 & \dots\dots ① \\ 3x - y = 20 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

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

$$③ \quad 2x + y = -10$$

$$② \quad \begin{array}{r} +) 3x - y = 20 \\ \underline{3x y = 10} \\ 5x = 10 \end{array}$$

$$x = 2$$

$x = 2$ を③に代入すると

$$\begin{aligned} 2x + y &= -10 \\ 2 \times 2 + y &= -10 \\ 4 + y &= -10 \\ y &= -14 \end{aligned}$$

答え $x = 2, y = -14$

$$\begin{cases} -x - y = -6 \\ \frac{1}{18}x + \frac{2}{9}y = 1 \end{cases}$$

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

$$\begin{cases} -x - y = -6 & \dots\dots ① \\ \frac{1}{18}x + \frac{2}{9}y = 1 & \dots\dots ② \end{cases}$$

②の両辺に18をかけると

$$\begin{aligned} \left(\frac{1}{18}x + \frac{2}{9}y\right) \times 18 &= 1 \times 18 \\ x + 4y &= 18 \quad \dots\dots ③ \end{aligned}$$

$$① \quad -x - y = -6$$

$$③ \quad \begin{array}{r} +) \quad x + 4y = 18 \\ \hline \quad \quad 3y = 12 \end{array}$$

$$y = 4$$

$y = 4$ を①に代入すると

$$-x - y = -6$$

$$-x - 1 \times 4 = -6$$

$$-x - 4 = -6$$

$$-x = -2$$

$$x = 2$$

答え $x = 2, y = 4$

$$\begin{cases} -x - \frac{3}{2}y = -1 & \dots\dots ① \\ -x - y = -5 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} \left(-x - \frac{3}{2}y\right) \times 2 &= -1 \times 2 \\ -2x - 3y &= -2 \quad \dots\dots ③ \end{aligned}$$

$$③ \quad -2x - 3y = -2$$

$$② \times 2 \quad \begin{array}{r} -) \quad -2x - 2y = -10 \\ \hline \quad \quad -y = 8 \end{array}$$

$$y = -8$$

$y = -8$ を②に代入すると

$$-x - y = -5$$

$$-x - 1 \times (-8) = -5$$

$$-x + 8 = -5$$

$$-x = -13$$

$$x = 13$$

答え $x = 13, y = -8$

$$\begin{cases} x - 5y = 12 \\ x + \frac{3}{2}y = -1 \end{cases}$$

$$\begin{cases} -x - y = -6 \\ -\frac{1}{2}x - \frac{1}{4}y = -2 \end{cases}$$

$$\begin{cases} x - 5y = 12 & \dots\dots ① \\ x + \frac{3}{2}y = -1 & \dots\dots ② \end{cases}$$

②の両辺に2をかけると

$$\begin{aligned} \left(x + \frac{3}{2}y\right) \times 2 &= -1 \times 2 \\ 2x + 3y &= -2 & \dots\dots ③ \end{aligned}$$

$$① \times 2 \quad 2x - 10y = 24$$

$$③ \quad \begin{array}{r} -) 2x + 3y = -2 \\ \hline -13y = 26 \end{array}$$

$$y = -2$$

$y = -2$ を③に代入すると

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

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

$$2x - 6 = -2$$

$$2x = 4$$

$$x = 2$$

答え $x = 2, y = -2$

$$\begin{cases} -x - y = -6 & \dots\dots ① \\ -\frac{1}{2}x - \frac{1}{4}y = -2 & \dots\dots ② \end{cases}$$

②の両辺に4をかけると

$$\begin{aligned} \left(-\frac{1}{2}x - \frac{1}{4}y\right) \times 4 &= -2 \times 4 \\ -2x - y &= -8 & \dots\dots ③ \end{aligned}$$

$$① \quad -x - y = -6$$

$$③ \quad \begin{array}{r} -) -2x - y = -8 \\ \hline x = 2 \end{array}$$

$$x = 2$$

$x = 2$ を①に代入すると

$$-x - y = -6$$

$$-1 \times 2 - y = -6$$

$$-2 - y = -6$$

$$-y = -4$$

$$y = 4$$

答え $x = 2, y = 4$

$$\begin{cases} -x - \frac{1}{2}y = -3 \\ -3x - 8y = 17 \end{cases}$$

$$\begin{cases} -2x - \frac{1}{2}y = -9 \\ x + 2y = 1 \end{cases}$$

$$\begin{cases} -x - \frac{1}{2}y = -3 & \dots\dots ① \\ -3x - 8y = 17 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} \left(-x - \frac{1}{2}y\right) \times 2 &= -3 \times 2 \\ -2x - y &= -6 & \dots\dots ③ \end{aligned}$$

$$③ \times 3 \quad -6x - 3y = -18$$

$$② \times 2 \quad \begin{array}{r} -) -6x - 16y = 34 \\ \hline 13y = -52 \end{array}$$

$$y = -4$$

$y = -4$ を③に代入すると

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

答え $x = 5, y = -4$

$$\begin{cases} -2x - \frac{1}{2}y = -9 & \dots\dots ① \\ x + 2y = 1 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} \left(-2x - \frac{1}{2}y\right) \times 2 &= -9 \times 2 \\ -4x - y &= -18 & \dots\dots ③ \end{aligned}$$

$$③ \times 2 \quad -8x - 2y = -36$$

$$② \quad \begin{array}{r} +) x + 2y = 1 \\ \hline -7x = -35 \end{array}$$

$$x = 5$$

$x = 5$ を②に代入すると

$$\begin{aligned} x + 2y &= 1 \\ 1 \times 5 + 2y &= 1 \\ 5 + 2y &= 1 \\ 2y &= -4 \\ y &= -2 \end{aligned}$$

答え $x = 5, y = -2$

$$\begin{cases} -\frac{1}{27}x + \frac{1}{9}y = 2 \\ x + y = -2 \end{cases}$$

$$\begin{cases} -\frac{3}{34}x - \frac{1}{17}y = 1 \\ x + y = -16 \end{cases}$$

$$\begin{cases} -\frac{1}{27}x + \frac{1}{9}y = 2 & \dots\dots ① \\ x + y = -2 & \dots\dots ② \end{cases}$$

①の両辺に27をかけると

$$\begin{aligned} \left(-\frac{1}{27}x + \frac{1}{9}y\right) \times 27 &= 2 \times 27 \\ -x + 3y &= 54 & \dots\dots ③ \end{aligned}$$

$$③ \quad -x + 3y = 54$$

$$② \quad \begin{array}{r} +) \quad x + y = -2 \\ \hline \quad 4y = 52 \end{array}$$

$$y = 13$$

$y = 13$ を②に代入すると

$$x + y = -2$$

$$x + 1 \times 13 = -2$$

$$x + 13 = -2$$

$$x = -15$$

答え $x = -15, y = 13$

$$\begin{cases} -\frac{3}{34}x - \frac{1}{17}y = 1 & \dots\dots ① \\ x + y = -16 & \dots\dots ② \end{cases}$$

①の両辺に34をかけると

$$\begin{aligned} \left(-\frac{3}{34}x - \frac{1}{17}y\right) \times 34 &= 1 \times 34 \\ -3x - 2y &= 34 & \dots\dots ③ \end{aligned}$$

$$③ \quad -3x - 2y = 34$$

$$② \times 2 \quad \begin{array}{r} +) \quad 2x + 2y = -32 \\ \hline \quad -x = 2 \end{array}$$

$$x = -2$$

$x = -2$ を②に代入すると

$$x + y = -16$$

$$1 \times (-2) + y = -16$$

$$-2 + y = -16$$

$$y = -14$$

答え $x = -2, y = -14$

$$\begin{cases} -x - 2y = -10 \\ \frac{1}{14}x - \frac{1}{7}y = 1 \end{cases}$$

$$\begin{cases} -2x - y = 21 \\ \frac{1}{6}x + \frac{1}{3}y = -2 \end{cases}$$

$$\begin{cases} -x - 2y = -10 & \dots\dots ① \\ \frac{1}{14}x - \frac{1}{7}y = 1 & \dots\dots ② \end{cases}$$

②の両辺に14をかけると

$$\begin{aligned} \left(\frac{1}{14}x - \frac{1}{7}y\right) \times 14 &= 1 \times 14 \\ x - 2y &= 14 & \dots\dots ③ \end{aligned}$$

$$① \quad -x - 2y = -10$$

$$③ \quad \begin{array}{r} +) \quad x - 2y = 14 \\ \hline -4y = 4 \end{array}$$

$$y = -1$$

$y = -1$ を①に代入すると

$$-x - 2y = -10$$

$$-x - 2 \times (-1) = -10$$

$$-x + 2 = -10$$

$$-x = -12$$

$$x = 12$$

答え $x = 12, y = -1$

$$\begin{cases} -2x - y = 21 & \dots\dots ① \\ \frac{1}{6}x + \frac{1}{3}y = -2 & \dots\dots ② \end{cases}$$

②の両辺に6をかけると

$$\begin{aligned} \left(\frac{1}{6}x + \frac{1}{3}y\right) \times 6 &= -2 \times 6 \\ x + 2y &= -12 & \dots\dots ③ \end{aligned}$$

$$① \quad -2x - y = 21$$

$$③ \times 2 \quad \begin{array}{r} +) \quad 2x + 4y = -24 \\ \hline 3y = -3 \end{array}$$

$$y = -1$$

$y = -1$ を③に代入すると

$$x + 2y = -12$$

$$x + 2 \times (-1) = -12$$

$$x - 2 = -12$$

$$x = -10$$

答え $x = -10, y = -1$

$$\begin{cases} -x - \frac{1}{2}y = 12 \\ x + 2y = -21 \end{cases}$$

$$\begin{cases} -\frac{1}{2}x + \frac{1}{3}y = -5 \\ -2x + y = -17 \end{cases}$$

$$\begin{cases} -x - \frac{1}{2}y = 12 & \dots\dots ① \\ x + 2y = -21 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} \left(-x - \frac{1}{2}y\right) \times 2 &= 12 \times 2 \\ -2x - y &= 24 & \dots\dots ③ \end{aligned}$$

$$③ \quad -2x - y = 24$$

$$② \times 2 \quad +) \quad \underline{2x + 4y = -42}$$

$$3y = -18$$

$$y = -6$$

$y = -6$ を③に代入すると

$$\begin{aligned} -2x - y &= 24 \\ -2x - 1 \times (-6) &= 24 \\ -2x + 6 &= 24 \\ -2x &= 18 \\ x &= -9 \end{aligned}$$

答え $x = -9, y = -6$

$$\begin{cases} -\frac{1}{2}x + \frac{1}{3}y = -5 & \dots\dots ① \\ -2x + y = -17 & \dots\dots ② \end{cases}$$

①の両辺に6をかけると

$$\begin{aligned} \left(-\frac{1}{2}x + \frac{1}{3}y\right) \times 6 &= -5 \times 6 \\ -3x + 2y &= -30 & \dots\dots ③ \end{aligned}$$

$$③ \quad -3x + 2y = -30$$

$$② \times 2 \quad -) \quad \underline{-4x + 2y = -34}$$

$$x = 4$$

$$x = 4$$

$x = 4$ を②に代入すると

$$\begin{aligned} -2x + y &= -17 \\ -2 \times 4 + y &= -17 \\ -8 + y &= -17 \\ y &= -9 \end{aligned}$$

答え $x = 4, y = -9$

$$\begin{cases} -2x + y = 0 \\ x + \frac{2}{3}y = 7 \end{cases}$$

$$\begin{cases} -x - y = 1 \\ \frac{3}{2}x + 2y = -9 \end{cases}$$

$$\begin{cases} -2x + y = 0 & \dots\dots \textcircled{1} \\ x + \frac{2}{3}y = 7 & \dots\dots \textcircled{2} \end{cases}$$

②の両辺に3をかけると

$$\begin{aligned} \left(x + \frac{2}{3}y\right) \times 3 &= 7 \times 3 \\ 3x + 2y &= 21 & \dots\dots \textcircled{3} \end{aligned}$$

$$\textcircled{1} \times 2 \quad -4x + 2y = 0$$

$$\textcircled{3} \quad \begin{array}{r} -) \quad 3x + 2y = 21 \\ \underline{-7x} \quad \quad = -21 \end{array}$$

$$x = 3$$

$x = 3$ を①に代入すると

$$-2x + y = 0$$

$$-2 \times 3 + y = 0$$

$$-6 + y = 0$$

$$y = 6$$

答え $x = 3, y = 6$

$$\begin{cases} -x - y = 1 & \dots\dots \textcircled{1} \\ \frac{3}{2}x + 2y = -9 & \dots\dots \textcircled{2} \end{cases}$$

②の両辺に2をかけると

$$\begin{aligned} \left(\frac{3}{2}x + 2y\right) \times 2 &= -9 \times 2 \\ 3x + 4y &= -18 & \dots\dots \textcircled{3} \end{aligned}$$

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

$$\textcircled{3} \quad \begin{array}{r} +) \quad 3x + 4y = -18 \\ \underline{\quad \quad} \quad \quad = -15 \end{array}$$

$$y = -15$$

$y = -15$ を①に代入すると

$$-x - y = 1$$

$$-x - 1 \times (-15) = 1$$

$$-x + 15 = 1$$

$$-x = -14$$

$$x = 14$$

答え $x = 14, y = -15$

問題

分数を含む連立方程式を解いてみましょう。

$$\begin{cases} -\frac{1}{2}x + \frac{3}{8}y = 1 \\ -x + \frac{1}{2}y = 5 \end{cases}$$

$$\begin{cases} -\frac{1}{3}x - \frac{1}{9}y = 2 \\ \frac{1}{6}x + \frac{2}{9}y = -3 \end{cases}$$

$$\begin{cases} -\frac{1}{2}x + \frac{3}{8}y = 1 & \dots\dots ① \\ -x + \frac{1}{2}y = 5 & \dots\dots ② \end{cases}$$

①の両辺に8をかけると

$$\begin{aligned} \left(-\frac{1}{2}x + \frac{3}{8}y\right) \times 8 &= 1 \times 8 \\ -4x + 3y &= 8 & \dots\dots ③ \end{aligned}$$

②の両辺に2をかけると

$$\begin{aligned} \left(-x + \frac{1}{2}y\right) \times 2 &= 5 \times 2 \\ -2x + y &= 10 & \dots\dots ④ \end{aligned}$$

$$③ \quad -4x + 3y = 8$$

$$④ \times 2 \quad -) \quad -4x + 2y = 20$$

$$\hline y = -12$$

$$y = -12$$

$y = -12$ を④に代入すると

$$\begin{aligned} -2x + y &= 10 \\ -2x + 1 \times (-12) &= 10 \\ -2x - 12 &= 10 \\ -2x &= 22 \\ x &= -11 \end{aligned}$$

答え $x = -11, y = -12$

$$\begin{cases} -\frac{1}{3}x - \frac{1}{9}y = 2 & \dots\dots ① \\ \frac{1}{6}x + \frac{2}{9}y = -3 & \dots\dots ② \end{cases}$$

①の両辺に9をかけると

$$\begin{aligned} \left(-\frac{1}{3}x - \frac{1}{9}y\right) \times 9 &= 2 \times 9 \\ -3x - y &= 18 & \dots\dots ③ \end{aligned}$$

②の両辺に18をかけると

$$\begin{aligned} \left(\frac{1}{6}x + \frac{2}{9}y\right) \times 18 &= -3 \times 18 \\ 3x + 4y &= -54 & \dots\dots ④ \end{aligned}$$

$$③ \quad -3x - y = 18$$

$$④ \quad +) \quad 3x + 4y = -54$$

$$\hline 3y = -36$$

$$y = -12$$

$y = -12$ を③に代入すると

$$\begin{aligned} -3x - y &= 18 \\ -3x - 1 \times (-12) &= 18 \\ -3x + 12 &= 18 \\ -3x &= 6 \\ x &= -2 \end{aligned}$$

答え $x = -2, y = -12$

$$\begin{cases} \frac{1}{3}x - \frac{1}{6}y = -3 \\ 2x + \frac{1}{2}y = -30 \end{cases}$$

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

$$\begin{cases} \frac{1}{3}x - \frac{1}{6}y = -3 & \dots\dots \textcircled{1} \\ 2x + \frac{1}{2}y = -30 & \dots\dots \textcircled{2} \end{cases}$$

①の両辺に6をかけると

$$\begin{aligned} \left(\frac{1}{3}x - \frac{1}{6}y\right) \times 6 &= -3 \times 6 \\ 2x - y &= -18 & \dots\dots \textcircled{3} \end{aligned}$$

②の両辺に2をかけると

$$\begin{aligned} \left(2x + \frac{1}{2}y\right) \times 2 &= -30 \times 2 \\ 4x + y &= -60 & \dots\dots \textcircled{4} \end{aligned}$$

$$\textcircled{3} \quad 2x - y = -18$$

$$\textcircled{4} \quad \begin{array}{r} +) 4x + y = -60 \\ \hline 6x \quad = -78 \end{array}$$

$$x = -13$$

$x = -13$ を ③ に代入すると

$$\begin{aligned} 2x - y &= -18 \\ 2 \times (-13) - y &= -18 \\ -26 - y &= -18 \\ -y &= 8 \\ y &= -8 \end{aligned}$$

答え $x = -13, y = -8$

$$\begin{cases} \frac{1}{2}x + y = -7 & \dots\dots \textcircled{1} \\ \frac{1}{2}x - \frac{1}{3}y = 1 & \dots\dots \textcircled{2} \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} \left(\frac{1}{2}x + y\right) \times 2 &= -7 \times 2 \\ x + 2y &= -14 & \dots\dots \textcircled{3} \end{aligned}$$

②の両辺に6をかけると

$$\begin{aligned} \left(\frac{1}{2}x - \frac{1}{3}y\right) \times 6 &= 1 \times 6 \\ 3x - 2y &= 6 & \dots\dots \textcircled{4} \end{aligned}$$

$$\textcircled{3} \quad x + 2y = -14$$

$$\textcircled{4} \quad \begin{array}{r} +) 3x - 2y = 6 \\ \hline 4x \quad = -8 \end{array}$$

$$x = -2$$

$x = -2$ を ④ に代入すると

$$\begin{aligned} 3x - 2y &= 6 \\ 3 \times (-2) - 2y &= 6 \\ -6 - 2y &= 6 \\ -2y &= 12 \\ y &= -6 \end{aligned}$$

答え $x = -2, y = -6$

$$\begin{cases} -\frac{2}{3}x + \frac{1}{2}y = 3 \\ \frac{1}{8}x - \frac{1}{16}y = -1 \end{cases}$$

$$\begin{cases} -\frac{3}{8}x - \frac{1}{4}y = 1 \\ -\frac{1}{4}x + \frac{1}{2}y = -6 \end{cases}$$

$$\begin{cases} -\frac{2}{3}x + \frac{1}{2}y = 3 & \dots\dots ① \\ \frac{1}{8}x - \frac{1}{16}y = -1 & \dots\dots ② \end{cases}$$

①の両辺に6をかけると

$$\begin{aligned} \left(-\frac{2}{3}x + \frac{1}{2}y\right) \times 6 &= 3 \times 6 \\ -4x + 3y &= 18 & \dots\dots ③ \end{aligned}$$

②の両辺に16をかけると

$$\begin{aligned} \left(\frac{1}{8}x - \frac{1}{16}y\right) \times 16 &= -1 \times 16 \\ 2x - y &= -16 & \dots\dots ④ \end{aligned}$$

$$③ \quad -4x + 3y = 18$$

$$\begin{array}{r} ④ \times 2 \quad +) \quad 4x - 2y = -32 \\ \hline y = -14 \\ y = -14 \end{array}$$

$y = -14$ を④に代入すると

$$\begin{aligned} 2x - y &= -16 \\ 2x - 1 \times (-14) &= -16 \\ 2x + 14 &= -16 \\ 2x &= -30 \\ x &= -15 \end{aligned}$$

答え $x = -15, y = -14$

$$\begin{cases} -\frac{3}{8}x - \frac{1}{4}y = 1 & \dots\dots ① \\ -\frac{1}{4}x + \frac{1}{2}y = -6 & \dots\dots ② \end{cases}$$

①の両辺に8をかけると

$$\begin{aligned} \left(-\frac{3}{8}x - \frac{1}{4}y\right) \times 8 &= 1 \times 8 \\ -3x - 2y &= 8 & \dots\dots ③ \end{aligned}$$

②の両辺に4をかけると

$$\begin{aligned} \left(-\frac{1}{4}x + \frac{1}{2}y\right) \times 4 &= -6 \times 4 \\ -x + 2y &= -24 & \dots\dots ④ \end{aligned}$$

$$③ \quad -3x - 2y = 8$$

$$\begin{array}{r} ④ \quad +) \quad -x + 2y = -24 \\ \hline -4x \quad = -16 \\ x = 4 \end{array}$$

$x = 4$ を③に代入すると

$$\begin{aligned} -3x - 2y &= 8 \\ -3 \times 4 - 2y &= 8 \\ -12 - 2y &= 8 \\ -2y &= 20 \\ y &= -10 \end{aligned}$$

答え $x = 4, y = -10$

$$\begin{cases} -\frac{1}{5}x + \frac{1}{10}y = 1 \\ -x - \frac{1}{2}y = -1 \end{cases}$$

$$\begin{cases} -\frac{2}{15}x - \frac{1}{5}y = -1 \\ \frac{2}{9}x - \frac{1}{3}y = 1 \end{cases}$$

$$\begin{cases} -\frac{1}{5}x + \frac{1}{10}y = 1 & \dots\dots ① \\ -x - \frac{1}{2}y = -1 & \dots\dots ② \end{cases}$$

①の両辺に10をかけると

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

②の両辺に2をかけると

$$\begin{aligned} \left(-x - \frac{1}{2}y\right) \times 2 &= -1 \times 2 \\ -2x - y &= -2 & \dots\dots ④ \end{aligned}$$

$$③ \quad -2x + y = 10$$

$$④ \quad \begin{array}{r} -) -2x - y = -2 \\ \hline 2y = 12 \end{array}$$

$$y = 6$$

$y = 6$ を④に代入すると

$$\begin{aligned} -2x - y &= -2 \\ -2x - 1 \times 6 &= -2 \\ -2x - 6 &= -2 \\ -2x &= 4 \\ x &= -2 \end{aligned}$$

答え $x = -2, y = 6$

$$\begin{cases} -\frac{2}{15}x - \frac{1}{5}y = -1 & \dots\dots ① \\ \frac{2}{9}x - \frac{1}{3}y = 1 & \dots\dots ② \end{cases}$$

①の両辺に15をかけると

$$\begin{aligned} \left(-\frac{2}{15}x - \frac{1}{5}y\right) \times 15 &= -1 \times 15 \\ -2x - 3y &= -15 & \dots\dots ③ \end{aligned}$$

②の両辺に9をかけると

$$\begin{aligned} \left(\frac{2}{9}x - \frac{1}{3}y\right) \times 9 &= 1 \times 9 \\ 2x - 3y &= 9 & \dots\dots ④ \end{aligned}$$

$$③ \quad -2x - 3y = -15$$

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

$$y = 1$$

$y = 1$ を④に代入すると

$$\begin{aligned} 2x - 3y &= 9 \\ 2x - 3 \times 1 &= 9 \\ 2x - 3 &= 9 \\ 2x &= 12 \\ x &= 6 \end{aligned}$$

答え $x = 6, y = 1$

$$\begin{cases} -\frac{3}{16}x + \frac{1}{4}y = 1 \\ -\frac{1}{2}x + y = 3 \end{cases}$$

$$\begin{cases} -x - \frac{2}{3}y = -14 \\ x + \frac{1}{3}y = 13 \end{cases}$$

$$\begin{cases} -\frac{3}{16}x + \frac{1}{4}y = 1 & \dots\dots ① \\ -\frac{1}{2}x + y = 3 & \dots\dots ② \end{cases}$$

①の両辺に16をかけると

$$\begin{aligned} \left(-\frac{3}{16}x + \frac{1}{4}y\right) \times 16 &= 1 \times 16 \\ -3x + 4y &= 16 & \dots\dots ③ \end{aligned}$$

②の両辺に2をかけると

$$\begin{aligned} \left(-\frac{1}{2}x + y\right) \times 2 &= 3 \times 2 \\ -x + 2y &= 6 & \dots\dots ④ \end{aligned}$$

$$③ \quad -3x + 4y = 16$$

$$④ \times 2 \quad -) \quad -2x + 4y = 12$$

$$\quad \quad \quad -x \quad = \quad 4$$

$$x = -4$$

$x = -4$ を④に代入すると

$$\begin{aligned} -x + 2y &= 6 \\ -1 \times (-4) + 2y &= 6 \\ 4 + 2y &= 6 \\ 2y &= 2 \\ y &= 1 \end{aligned}$$

答え $x = -4, y = 1$

$$\begin{cases} -x - \frac{2}{3}y = -14 & \dots\dots ① \\ x + \frac{1}{3}y = 13 & \dots\dots ② \end{cases}$$

①の両辺に3をかけると

$$\begin{aligned} \left(-x - \frac{2}{3}y\right) \times 3 &= -14 \times 3 \\ -3x - 2y &= -42 & \dots\dots ③ \end{aligned}$$

②の両辺に3をかけると

$$\begin{aligned} \left(x + \frac{1}{3}y\right) \times 3 &= 13 \times 3 \\ 3x + y &= 39 & \dots\dots ④ \end{aligned}$$

$$③ \quad -3x - 2y = -42$$

$$④ \quad +) \quad 3x + y = 39$$

$$\quad \quad \quad -y = -3$$

$$y = 3$$

$y = 3$ を④に代入すると

$$\begin{aligned} 3x + y &= 39 \\ 3x + 1 \times 3 &= 39 \\ 3x + 3 &= 39 \\ 3x &= 36 \\ x &= 12 \end{aligned}$$

答え $x = 12, y = 3$

$$\begin{cases} -\frac{3}{22}x - \frac{1}{11}y = -1 \\ -\frac{1}{2}x + y = -13 \end{cases}$$

$$\begin{cases} -\frac{1}{3}x + y = -1 \\ \frac{1}{9}x + \frac{1}{3}y = -1 \end{cases}$$

$$\begin{cases} -\frac{3}{22}x - \frac{1}{11}y = -1 & \dots\dots ① \\ -\frac{1}{2}x + y = -13 & \dots\dots ② \end{cases}$$

①の両辺に22をかけると

$$\begin{aligned} \left(-\frac{3}{22}x - \frac{1}{11}y\right) \times 22 &= -1 \times 22 \\ -3x - 2y &= -22 & \dots\dots ③ \end{aligned}$$

②の両辺に2をかけると

$$\begin{aligned} \left(-\frac{1}{2}x + y\right) \times 2 &= -13 \times 2 \\ -x + 2y &= -26 & \dots\dots ④ \end{aligned}$$

$$③ \quad -3x - 2y = -22$$

$$④ \quad \begin{array}{r} +) -x + 2y = -26 \\ \hline -4x \quad \quad = -48 \end{array}$$

$$x = 12$$

$x = 12$ を④に代入すると

$$\begin{aligned} -x + 2y &= -26 \\ -1 \times 12 + 2y &= -26 \\ -12 + 2y &= -26 \\ 2y &= -14 \\ y &= -7 \end{aligned}$$

答え $x = 12, y = -7$

$$\begin{cases} -\frac{1}{3}x + y = -1 & \dots\dots ① \\ \frac{1}{9}x + \frac{1}{3}y = -1 & \dots\dots ② \end{cases}$$

①の両辺に3をかけると

$$\begin{aligned} \left(-\frac{1}{3}x + y\right) \times 3 &= -1 \times 3 \\ -x + 3y &= -3 & \dots\dots ③ \end{aligned}$$

②の両辺に9をかけると

$$\begin{aligned} \left(\frac{1}{9}x + \frac{1}{3}y\right) \times 9 &= -1 \times 9 \\ x + 3y &= -9 & \dots\dots ④ \end{aligned}$$

$$③ \quad -x + 3y = -3$$

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

$$y = -2$$

$y = -2$ を③に代入すると

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

答え $x = -3, y = -2$

$$\begin{cases} -\frac{1}{5}x - \frac{3}{10}y = -2 \\ -\frac{1}{6}x + \frac{1}{3}y = 3 \end{cases}$$

$$\begin{cases} -\frac{1}{42}x - \frac{2}{21}y = 1 \\ \frac{1}{2}x + y = -8 \end{cases}$$

$$\begin{cases} -\frac{1}{5}x - \frac{3}{10}y = -2 & \dots\dots ① \\ -\frac{1}{6}x + \frac{1}{3}y = 3 & \dots\dots ② \end{cases}$$

$$\begin{cases} -\frac{1}{42}x - \frac{2}{21}y = 1 & \dots\dots ① \\ \frac{1}{2}x + y = -8 & \dots\dots ② \end{cases}$$

①の両辺に10をかけると

$$\begin{aligned} \left(-\frac{1}{5}x - \frac{3}{10}y\right) \times 10 &= -2 \times 10 \\ -2x - 3y &= -20 & \dots\dots ③ \end{aligned}$$

①の両辺に42をかけると

$$\begin{aligned} \left(-\frac{1}{42}x - \frac{2}{21}y\right) \times 42 &= 1 \times 42 \\ -x - 4y &= 42 & \dots\dots ③ \end{aligned}$$

②の両辺に6をかけると

$$\begin{aligned} \left(-\frac{1}{6}x + \frac{1}{3}y\right) \times 6 &= 3 \times 6 \\ -x + 2y &= 18 & \dots\dots ④ \end{aligned}$$

②の両辺に2をかけると

$$\begin{aligned} \left(\frac{1}{2}x + y\right) \times 2 &= -8 \times 2 \\ x + 2y &= -16 & \dots\dots ④ \end{aligned}$$

$$③ \quad -2x - 3y = -20$$

$$③ \quad -x - 4y = 42$$

$$④ \times 2 \quad -) \quad -2x + 4y = 36$$

$$\hline -7y = -56$$

$$④ \quad +) \quad x + 2y = -16$$

$$\hline -2y = 26$$

$$y = 8$$

$$y = -13$$

$y = 8$ を④に代入すると

$$\begin{aligned} -x + 2y &= 18 \\ -x + 2 \times 8 &= 18 \\ -x + 16 &= 18 \\ -x &= 2 \\ x &= -2 \end{aligned}$$

$y = -13$ を④に代入すると

$$\begin{aligned} x + 2y &= -16 \\ x + 2 \times (-13) &= -16 \\ x - 26 &= -16 \\ x &= 10 \end{aligned}$$

答え $x = -2, y = 8$

答え $x = 10, y = -13$

$$\begin{cases} -\frac{3}{10}x + \frac{1}{4}y = 3 \\ \frac{1}{4}x - \frac{1}{8}y = -2 \end{cases}$$

$$\begin{cases} -\frac{1}{14}x - \frac{1}{7}y = -1 \\ \frac{1}{5}x + \frac{1}{3}y = 2 \end{cases}$$

$$\begin{cases} -\frac{3}{10}x + \frac{1}{4}y = 3 & \dots\dots① \\ \frac{1}{4}x - \frac{1}{8}y = -2 & \dots\dots② \end{cases}$$

①の両辺に20をかけると

$$\begin{aligned} \left(-\frac{3}{10}x + \frac{1}{4}y\right) \times 20 &= 3 \times 20 \\ -6x + 5y &= 60 & \dots\dots③ \end{aligned}$$

②の両辺に8をかけると

$$\begin{aligned} \left(\frac{1}{4}x - \frac{1}{8}y\right) \times 8 &= -2 \times 8 \\ 2x - y &= -16 & \dots\dots④ \end{aligned}$$

$$③ \quad -6x + 5y = 60$$

$$④ \times 3 \quad +) \quad \underline{6x - 3y = -48}$$

$$2y = 12$$

$$y = 6$$

$y = 6$ を④に代入すると

$$2x - y = -16$$

$$2x - 1 \times 6 = -16$$

$$2x - 6 = -16$$

$$2x = -10$$

$$x = -5$$

答え $x = -5, y = 6$

$$\begin{cases} -\frac{1}{14}x - \frac{1}{7}y = -1 & \dots\dots① \\ \frac{1}{5}x + \frac{1}{3}y = 2 & \dots\dots② \end{cases}$$

①の両辺に14をかけると

$$\begin{aligned} \left(-\frac{1}{14}x - \frac{1}{7}y\right) \times 14 &= -1 \times 14 \\ -x - 2y &= -14 & \dots\dots③ \end{aligned}$$

②の両辺に15をかけると

$$\begin{aligned} \left(\frac{1}{5}x + \frac{1}{3}y\right) \times 15 &= 2 \times 15 \\ 3x + 5y &= 30 & \dots\dots④ \end{aligned}$$

$$③ \times 3 \quad -3x - 6y = -42$$

$$④ \quad +) \quad \underline{3x + 5y = 30}$$

$$-y = -12$$

$$y = 12$$

$y = 12$ を③に代入すると

$$-x - 2y = -14$$

$$-x - 2 \times 12 = -14$$

$$-x - 24 = -14$$

$$-x = 10$$

$$x = -10$$

答え $x = -10, y = 12$

$$\begin{cases} -\frac{1}{2}x + \frac{1}{4}y = 5 \\ \frac{2}{25}x - \frac{1}{50}y = -1 \end{cases}$$

$$\begin{cases} -\frac{1}{14}x + \frac{1}{7}y = -1 \\ \frac{1}{2}x - \frac{1}{4}y = 1 \end{cases}$$

$$\begin{cases} -\frac{1}{2}x + \frac{1}{4}y = 5 & \dots\dots① \\ \frac{2}{25}x - \frac{1}{50}y = -1 & \dots\dots② \end{cases}$$

①の両辺に4をかけると

$$\begin{aligned} \left(-\frac{1}{2}x + \frac{1}{4}y\right) \times 4 &= 5 \times 4 \\ -2x + y &= 20 & \dots\dots③ \end{aligned}$$

②の両辺に50をかけると

$$\begin{aligned} \left(\frac{2}{25}x - \frac{1}{50}y\right) \times 50 &= -1 \times 50 \\ 4x - y &= -50 & \dots\dots④ \end{aligned}$$

$$③ \quad -2x + y = 20$$

$$④ \quad \begin{array}{r} +) \quad 4x - y = -50 \\ \hline 2x \quad = -30 \end{array}$$

$$x = -15$$

$x = -15$ を③に代入すると

$$\begin{aligned} -2x + y &= 20 \\ -2 \times (-15) + y &= 20 \\ 30 + y &= 20 \\ y &= -10 \end{aligned}$$

答え $x = -15, y = -10$

$$\begin{cases} -\frac{1}{14}x + \frac{1}{7}y = -1 & \dots\dots① \\ \frac{1}{2}x - \frac{1}{4}y = 1 & \dots\dots② \end{cases}$$

①の両辺に14をかけると

$$\begin{aligned} \left(-\frac{1}{14}x + \frac{1}{7}y\right) \times 14 &= -1 \times 14 \\ -x + 2y &= -14 & \dots\dots③ \end{aligned}$$

②の両辺に4をかけると

$$\begin{aligned} \left(\frac{1}{2}x - \frac{1}{4}y\right) \times 4 &= 1 \times 4 \\ 2x - y &= 4 & \dots\dots④ \end{aligned}$$

$$③ \times 2 \quad -2x + 4y = -28$$

$$④ \quad \begin{array}{r} +) \quad 2x - y = 4 \\ \hline 3y = -24 \end{array}$$

$$y = -8$$

$y = -8$ を④に代入すると

$$\begin{aligned} 2x - y &= 4 \\ 2x - 1 \times (-8) &= 4 \\ 2x + 8 &= 4 \\ 2x &= -4 \\ x &= -2 \end{aligned}$$

答え $x = -2, y = -8$

$$\begin{cases} -\frac{2}{9}x - \frac{1}{18}y = 1 \\ -\frac{2}{5}x + \frac{3}{10}y = 1 \end{cases}$$

$$\begin{cases} \frac{3}{2}x - 2y = -1 \\ \frac{3}{2}x - y = 10 \end{cases}$$

$$\begin{cases} -\frac{2}{9}x - \frac{1}{18}y = 1 & \dots\dots ① \\ -\frac{2}{5}x + \frac{3}{10}y = 1 & \dots\dots ② \end{cases}$$

①の両辺に18をかけると

$$\begin{aligned} \left(-\frac{2}{9}x - \frac{1}{18}y\right) \times 18 &= 1 \times 18 \\ -4x - y &= 18 & \dots\dots ③ \end{aligned}$$

②の両辺に10をかけると

$$\begin{aligned} \left(-\frac{2}{5}x + \frac{3}{10}y\right) \times 10 &= 1 \times 10 \\ -4x + 3y &= 10 & \dots\dots ④ \end{aligned}$$

$$③ \quad -4x - y = 18$$

$$④ \quad \begin{array}{r} -) -4x + 3y = 10 \\ \underline{-4x - y = 18} \\ 4y = -8 \end{array}$$

$$y = -2$$

$y = -2$ を④に代入すると

$$\begin{aligned} -4x + 3y &= 10 \\ -4x + 3 \times (-2) &= 10 \\ -4x - 6 &= 10 \\ -4x &= 16 \\ x &= -4 \end{aligned}$$

答え $x = -4, y = -2$

$$\begin{cases} \frac{3}{2}x - 2y = -1 & \dots\dots ① \\ \frac{3}{2}x - y = 10 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} \left(\frac{3}{2}x - 2y\right) \times 2 &= -1 \times 2 \\ 3x - 4y &= -2 & \dots\dots ③ \end{aligned}$$

②の両辺に2をかけると

$$\begin{aligned} \left(\frac{3}{2}x - y\right) \times 2 &= 10 \times 2 \\ 3x - 2y &= 20 & \dots\dots ④ \end{aligned}$$

$$③ \quad 3x - 4y = -2$$

$$④ \quad \begin{array}{r} -) 3x - 2y = 20 \\ \underline{-3x - 4y = -2} \\ -2y = -22 \end{array}$$

$$y = 11$$

$y = 11$ を④に代入すると

$$\begin{aligned} 3x - 2y &= 20 \\ 3x - 2 \times 11 &= 20 \\ 3x - 22 &= 20 \\ 3x &= 42 \\ x &= 14 \end{aligned}$$

答え $x = 14, y = 11$

$$\begin{cases} -\frac{1}{4}x + \frac{1}{8}y = -2 \\ \frac{3}{14}x - \frac{2}{7}y = 1 \end{cases}$$

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

$$\begin{cases} -\frac{1}{4}x + \frac{1}{8}y = -2 & \dots\dots ① \\ \frac{3}{14}x - \frac{2}{7}y = 1 & \dots\dots ② \end{cases}$$

①の両辺に8をかけると

$$\begin{aligned} \left(-\frac{1}{4}x + \frac{1}{8}y\right) \times 8 &= -2 \times 8 \\ -2x + y &= -16 & \dots\dots ③ \end{aligned}$$

②の両辺に14をかけると

$$\begin{aligned} \left(\frac{3}{14}x - \frac{2}{7}y\right) \times 14 &= 1 \times 14 \\ 3x - 4y &= 14 & \dots\dots ④ \end{aligned}$$

$$③ \times 3 \quad -6x + 3y = -48$$

$$④ \times 2 \quad \begin{array}{r} +) \quad 6x - 8y = 28 \\ \hline -5y = -20 \end{array}$$

$$y = 4$$

$y = 4$ を③に代入すると

$$\begin{aligned} -2x + y &= -16 \\ -2x + 1 \times 4 &= -16 \\ -2x + 4 &= -16 \\ -2x &= -20 \\ x &= 10 \end{aligned}$$

答え $x = 10, y = 4$

$$\begin{cases} -\frac{1}{4}x - \frac{1}{2}y = -3 & \dots\dots ① \\ -\frac{2}{3}x - \frac{1}{2}y = 2 & \dots\dots ② \end{cases}$$

①の両辺に4をかけると

$$\begin{aligned} \left(-\frac{1}{4}x - \frac{1}{2}y\right) \times 4 &= -3 \times 4 \\ -x - 2y &= -12 & \dots\dots ③ \end{aligned}$$

②の両辺に6をかけると

$$\begin{aligned} \left(-\frac{2}{3}x - \frac{1}{2}y\right) \times 6 &= 2 \times 6 \\ -4x - 3y &= 12 & \dots\dots ④ \end{aligned}$$

$$③ \times 4 \quad -4x - 8y = -48$$

$$④ \quad \begin{array}{r} -) \quad -4x - 3y = 12 \\ \hline -5y = -60 \end{array}$$

$$y = 12$$

$y = 12$ を③に代入すると

$$\begin{aligned} -x - 2y &= -12 \\ -x - 2 \times 12 &= -12 \\ -x - 24 &= -12 \\ -x &= 12 \\ x &= -12 \end{aligned}$$

答え $x = -12, y = 12$

$$\begin{cases} -\frac{1}{9}x - \frac{1}{3}y = 1 \\ \frac{1}{3}x + \frac{1}{2}y = -2 \end{cases}$$

$$\begin{cases} -x + \frac{1}{2}y = -5 \\ -\frac{1}{14}x + \frac{1}{7}y = -1 \end{cases}$$

$$\begin{cases} -\frac{1}{9}x - \frac{1}{3}y = 1 & \dots\dots ① \\ \frac{1}{3}x + \frac{1}{2}y = -2 & \dots\dots ② \end{cases}$$

①の両辺に9をかけると

$$\begin{aligned} \left(-\frac{1}{9}x - \frac{1}{3}y\right) \times 9 &= 1 \times 9 \\ -x - 3y &= 9 & \dots\dots ③ \end{aligned}$$

②の両辺に6をかけると

$$\begin{aligned} \left(\frac{1}{3}x + \frac{1}{2}y\right) \times 6 &= -2 \times 6 \\ 2x + 3y &= -12 & \dots\dots ④ \end{aligned}$$

$$③ \quad -x - 3y = 9$$

$$④ \quad \begin{array}{r} +) 2x + 3y = -12 \\ \hline x \qquad = -3 \end{array}$$

$$x = -3$$

$x = -3$ を③に代入すると

$$\begin{aligned} -x - 3y &= 9 \\ -1 \times (-3) - 3y &= 9 \\ 3 - 3y &= 9 \\ -3y &= 6 \\ y &= -2 \end{aligned}$$

答え $x = -3, y = -2$

$$\begin{cases} -x + \frac{1}{2}y = -5 & \dots\dots ① \\ -\frac{1}{14}x + \frac{1}{7}y = -1 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

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

②の両辺に14をかけると

$$\begin{aligned} \left(-\frac{1}{14}x + \frac{1}{7}y\right) \times 14 &= -1 \times 14 \\ -x + 2y &= -14 & \dots\dots ④ \end{aligned}$$

$$③ \quad -2x + y = -10$$

$$④ \times 2 \quad \begin{array}{r} -) -2x + 4y = -28 \\ \hline -3y = 18 \end{array}$$

$$y = -6$$

$y = -6$ を③に代入すると

$$\begin{aligned} -2x + y &= -10 \\ -2x + 1 \times (-6) &= -10 \\ -2x - 6 &= -10 \\ -2x &= -4 \\ x &= 2 \end{aligned}$$

答え $x = 2, y = -6$

$$\begin{cases} -\frac{2}{7}x + \frac{3}{14}y = 1 \\ 2x - \frac{1}{2}y = 3 \end{cases}$$

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

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

①の両辺に14をかけると

$$\begin{aligned} \left(-\frac{2}{7}x + \frac{3}{14}y\right) \times 14 &= 1 \times 14 \\ -4x + 3y &= 14 & \dots\dots ③ \end{aligned}$$

②の両辺に2をかけると

$$\begin{aligned} \left(2x - \frac{1}{2}y\right) \times 2 &= 3 \times 2 \\ 4x - y &= 6 & \dots\dots ④ \end{aligned}$$

$$③ \quad -4x + 3y = 14$$

$$④ \quad \begin{array}{r} +) \quad 4x - y = 6 \\ \hline 2y = 20 \end{array}$$

$$y = 10$$

$y = 10$ を④に代入すると

$$4x - y = 6$$

$$4x - 1 \times 10 = 6$$

$$4x - 10 = 6$$

$$4x = 16$$

$$x = 4$$

答え $x = 4, y = 10$

$$\begin{cases} x + \frac{1}{2}y = -1 & \dots\dots ① \\ x + \frac{3}{2}y = 1 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} \left(x + \frac{1}{2}y\right) \times 2 &= -1 \times 2 \\ 2x + y &= -2 & \dots\dots ③ \end{aligned}$$

②の両辺に2をかけると

$$\begin{aligned} \left(x + \frac{3}{2}y\right) \times 2 &= 1 \times 2 \\ 2x + 3y &= 2 & \dots\dots ④ \end{aligned}$$

$$③ \quad 2x + y = -2$$

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

$$y = 2$$

$y = 2$ を③に代入すると

$$2x + y = -2$$

$$2x + 1 \times 2 = -2$$

$$2x + 2 = -2$$

$$2x = -4$$

$$x = -2$$

答え $x = -2, y = 2$

$$\begin{cases} \frac{1}{26}x + \frac{2}{13}y = 1 \\ \frac{1}{2}x + y = 3 \end{cases}$$

$$\begin{cases} -2x - \frac{1}{2}y = -7 \\ -\frac{2}{3}x - y = 6 \end{cases}$$

$$\begin{cases} \frac{1}{26}x + \frac{2}{13}y = 1 & \dots\dots ① \\ \frac{1}{2}x + y = 3 & \dots\dots ② \end{cases}$$

①の両辺に26をかけると

$$\begin{aligned} \left(\frac{1}{26}x + \frac{2}{13}y\right) \times 26 &= 1 \times 26 \\ x + 4y &= 26 & \dots\dots ③ \end{aligned}$$

②の両辺に2をかけると

$$\begin{aligned} \left(\frac{1}{2}x + y\right) \times 2 &= 3 \times 2 \\ x + 2y &= 6 & \dots\dots ④ \end{aligned}$$

$$③ \quad x + 4y = 26$$

$$④ \quad \begin{array}{r} -)x + 2y = 6 \\ \hline 2y = 20 \end{array}$$

$$y = 10$$

$y = 10$ を④に代入すると

$$x + 2y = 6$$

$$x + 2 \times 10 = 6$$

$$x + 20 = 6$$

$$x = -14$$

答え $x = -14, y = 10$

$$\begin{cases} -2x - \frac{1}{2}y = -7 & \dots\dots ① \\ -\frac{2}{3}x - y = 6 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} \left(-2x - \frac{1}{2}y\right) \times 2 &= -7 \times 2 \\ -4x - y &= -14 & \dots\dots ③ \end{aligned}$$

②の両辺に3をかけると

$$\begin{aligned} \left(-\frac{2}{3}x - y\right) \times 3 &= 6 \times 3 \\ -2x - 3y &= 18 & \dots\dots ④ \end{aligned}$$

$$③ \quad -4x - y = -14$$

$$④ \times 2 \quad \begin{array}{r} -) -4x - 6y = 36 \\ \hline 5y = -50 \end{array}$$

$$y = -10$$

$y = -10$ を③に代入すると

$$-4x - y = -14$$

$$-4x - 1 \times (-10) = -14$$

$$-4x + 10 = -14$$

$$-4x = -24$$

$$x = 6$$

答え $x = 6, y = -10$

問題

分数を含む連立方程式を解いてみましょう。

$$\begin{cases} -\frac{1}{17}x - \frac{2}{51}y = 1 \\ -x + y = 7 \end{cases}$$

$$\begin{cases} -x + y = 19 \\ \frac{1}{4}x + \frac{1}{2}y = -1 \end{cases}$$

$$\begin{cases} -\frac{1}{17}x - \frac{2}{51}y = 1 & \dots\dots ① \\ -x + y = 7 & \dots\dots ② \end{cases}$$

$$\begin{cases} -x + y = 19 & \dots\dots ① \\ \frac{1}{4}x + \frac{1}{2}y = -1 & \dots\dots ② \end{cases}$$

①の両辺に 51 をかけると

$$\begin{aligned} \left(-\frac{1}{17}x - \frac{2}{51}y\right) \times 51 &= 1 \times 51 \\ -3x - 2y &= 51 & \dots\dots ③ \end{aligned}$$

②の両辺に 4 をかけると

$$\begin{aligned} \left(\frac{1}{4}x + \frac{1}{2}y\right) \times 4 &= -1 \times 4 \\ x + 2y &= -4 & \dots\dots ③ \end{aligned}$$

$$③ \quad -3x - 2y = 51$$

$$① \quad -x + y = 19$$

$$② \times 2 \quad \begin{array}{r} +) -2x + 2y = 14 \\ \hline -5x \quad = 65 \end{array}$$

$$③ \quad \begin{array}{r} +) x + 2y = -4 \\ \hline 3y = 15 \end{array}$$

$$x = -13$$

$$y = 5$$

$x = -13$ を ② に代入すると

$y = 5$ を ③ に代入すると

$$-x + y = 7$$

$$x + 2y = -4$$

$$-1 \times (-13) + y = 7$$

$$x + 2 \times 5 = -4$$

$$13 + y = 7$$

$$x + 10 = -4$$

$$y = -6$$

$$x = -14$$

答え $x = -13, y = -6$

答え $x = -14, y = 5$

$$\begin{cases} -\frac{2}{3}x - y = 1 \\ \frac{1}{12}x + \frac{1}{4}y = -1 \end{cases}$$

$$\begin{cases} \frac{1}{3}x - \frac{1}{6}y = 1 \\ \frac{1}{4}x - \frac{1}{16}y = 1 \end{cases}$$

$$\begin{cases} -\frac{2}{3}x - y = 1 & \dots\dots ① \\ \frac{1}{12}x + \frac{1}{4}y = -1 & \dots\dots ② \end{cases}$$

①の両辺に3をかけると

$$\begin{aligned} \left(-\frac{2}{3}x - y\right) \times 3 &= 1 \times 3 \\ -2x - 3y &= 3 & \dots\dots ③ \end{aligned}$$

②の両辺に12をかけると

$$\begin{aligned} \left(\frac{1}{12}x + \frac{1}{4}y\right) \times 12 &= -1 \times 12 \\ x + 3y &= -12 & \dots\dots ④ \end{aligned}$$

$$③ \quad -2x - 3y = 3$$

$$④ \quad \begin{array}{r} +) \quad x + 3y = -12 \\ \hline -x \quad \quad = -9 \end{array}$$

$$x = 9$$

$x = 9$ を③に代入すると

$$\begin{aligned} -2x - 3y &= 3 \\ -2 \times 9 - 3y &= 3 \\ -18 - 3y &= 3 \\ -3y &= 21 \\ y &= -7 \end{aligned}$$

答え $x = 9, y = -7$

$$\begin{cases} \frac{1}{3}x - \frac{1}{6}y = 1 & \dots\dots ① \\ \frac{1}{4}x - \frac{1}{16}y = 1 & \dots\dots ② \end{cases}$$

①の両辺に6をかけると

$$\begin{aligned} \left(\frac{1}{3}x - \frac{1}{6}y\right) \times 6 &= 1 \times 6 \\ 2x - y &= 6 & \dots\dots ③ \end{aligned}$$

②の両辺に16をかけると

$$\begin{aligned} \left(\frac{1}{4}x - \frac{1}{16}y\right) \times 16 &= 1 \times 16 \\ 4x - y &= 16 & \dots\dots ④ \end{aligned}$$

$$③ \quad 2x - y = 6$$

$$④ \quad \begin{array}{r} -) \quad 4x - y = 16 \\ \hline -2x \quad \quad = -10 \end{array}$$

$$x = 5$$

$x = 5$ を③に代入すると

$$\begin{aligned} 2x - y &= 6 \\ 2 \times 5 - y &= 6 \\ 10 - y &= 6 \\ -y &= -4 \\ y &= 4 \end{aligned}$$

答え $x = 5, y = 4$

$$\begin{cases} x + \frac{1}{3}y = 2 \\ x - y = -10 \end{cases}$$

$$\begin{cases} \frac{1}{18}x - \frac{2}{9}y = 3 \\ \frac{1}{2}x - y = 12 \end{cases}$$

$$\begin{cases} x + \frac{1}{3}y = 2 & \dots\dots① \\ x - y = -10 & \dots\dots② \end{cases}$$

①の両辺に3をかけると

$$\begin{aligned} \left(x + \frac{1}{3}y\right) \times 3 &= 2 \times 3 \\ 3x + y &= 6 & \dots\dots③ \end{aligned}$$

$$③ \quad 3x + y = 6$$

$$② \quad \begin{array}{r} +) \quad x - y = -10 \\ \hline 4x \quad = -4 \end{array}$$

$$x = -1$$

$x = -1$ を③に代入すると

$$3x + y = 6$$

$$3 \times (-1) + y = 6$$

$$-3 + y = 6$$

$$y = 9$$

答え $x = -1, y = 9$

$$\begin{cases} \frac{1}{18}x - \frac{2}{9}y = 3 & \dots\dots① \\ \frac{1}{2}x - y = 12 & \dots\dots② \end{cases}$$

①の両辺に18をかけると

$$\begin{aligned} \left(\frac{1}{18}x - \frac{2}{9}y\right) \times 18 &= 3 \times 18 \\ x - 4y &= 54 & \dots\dots③ \end{aligned}$$

②の両辺に2をかけると

$$\begin{aligned} \left(\frac{1}{2}x - y\right) \times 2 &= 12 \times 2 \\ x - 2y &= 24 & \dots\dots④ \end{aligned}$$

$$③ \quad x - 4y = 54$$

$$④ \quad \begin{array}{r} -) \quad x - 2y = 24 \\ \hline -2y = 30 \end{array}$$

$$y = -15$$

$y = -15$ を④に代入すると

$$x - 2y = 24$$

$$x - 2 \times (-15) = 24$$

$$x + 30 = 24$$

$$x = -6$$

答え $x = -6, y = -15$

$$\begin{cases} -2x + \frac{3}{2}y = -13 \\ x - y = 6 \end{cases}$$

$$\begin{cases} -x - \frac{1}{2}y = -13 \\ \frac{1}{2}x + \frac{3}{8}y = 7 \end{cases}$$

$$\begin{cases} -2x + \frac{3}{2}y = -13 & \dots\dots ① \\ x - y = 6 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} (-2x + \frac{3}{2}y) \times 2 &= -13 \times 2 \\ -4x + 3y &= -26 & \dots\dots ③ \end{aligned}$$

$$③ \quad -4x + 3y = -26$$

$$② \times 3 \quad +) \quad \frac{3x - 3y = 18}{-x \quad = -8}$$

$$x = 8$$

$x = 8$ を ② に代入すると

$$x - y = 6$$

$$1 \times 8 - y = 6$$

$$8 - y = 6$$

$$-y = -2$$

$$y = 2$$

答え $x = 8, y = 2$

$$\begin{cases} -x - \frac{1}{2}y = -13 & \dots\dots ① \\ \frac{1}{2}x + \frac{3}{8}y = 7 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} (-x - \frac{1}{2}y) \times 2 &= -13 \times 2 \\ -2x - y &= -26 & \dots\dots ③ \end{aligned}$$

②の両辺に8をかけると

$$\begin{aligned} (\frac{1}{2}x + \frac{3}{8}y) \times 8 &= 7 \times 8 \\ 4x + 3y &= 56 & \dots\dots ④ \end{aligned}$$

$$③ \times 2 \quad -4x - 2y = -52$$

$$④ \quad +) \quad \frac{4x + 3y = 56}{y = 4}$$

$$y = 4$$

$y = 4$ を ③ に代入すると

$$-2x - y = -26$$

$$-2x - 1 \times 4 = -26$$

$$-2x - 4 = -26$$

$$-2x = -22$$

$$x = 11$$

答え $x = 11, y = 4$

$$\begin{cases} x - 4y = -14 \\ \frac{1}{2}x + \frac{1}{4}y = 2 \end{cases}$$

$$\begin{cases} -x - \frac{1}{2}y = -2 \\ \frac{1}{6}x + \frac{2}{9}y = 2 \end{cases}$$

$$\begin{cases} x - 4y = -14 & \dots\dots ① \\ \frac{1}{2}x + \frac{1}{4}y = 2 & \dots\dots ② \end{cases}$$

②の両辺に4をかけると

$$\begin{aligned} \left(\frac{1}{2}x + \frac{1}{4}y\right) \times 4 &= 2 \times 4 \\ 2x + y &= 8 \quad \dots\dots ③ \end{aligned}$$

$$① \times 2 \quad 2x - 8y = -28$$

$$③ \quad \begin{array}{r} -) 2x + y = 8 \\ \hline -9y = -36 \end{array}$$

$$y = 4$$

$y = 4$ を③に代入すると

$$2x + y = 8$$

$$2x + 1 \times 4 = 8$$

$$2x + 4 = 8$$

$$2x = 4$$

$$x = 2$$

答え $x = 2, y = 4$

$$\begin{cases} -x - \frac{1}{2}y = -2 & \dots\dots ① \\ \frac{1}{6}x + \frac{2}{9}y = 2 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} \left(-x - \frac{1}{2}y\right) \times 2 &= -2 \times 2 \\ -2x - y &= -4 \quad \dots\dots ③ \end{aligned}$$

②の両辺に18をかけると

$$\begin{aligned} \left(\frac{1}{6}x + \frac{2}{9}y\right) \times 18 &= 2 \times 18 \\ 3x + 4y &= 36 \quad \dots\dots ④ \end{aligned}$$

$$③ \times 3 \quad -6x - 3y = -12$$

$$④ \times 2 \quad \begin{array}{r} +) 6x + 8y = 72 \\ \hline 5y = 60 \end{array}$$

$$y = 12$$

$y = 12$ を③に代入すると

$$-2x - y = -4$$

$$-2x - 1 \times 12 = -4$$

$$-2x - 12 = -4$$

$$-2x = 8$$

$$x = -4$$

答え $x = -4, y = 12$

$$\begin{cases} -x - y = 0 \\ \frac{1}{3}x - \frac{3}{2}y = -11 \end{cases}$$

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

$$\begin{cases} -x - y = 0 & \dots\dots ① \\ \frac{1}{3}x - \frac{3}{2}y = -11 & \dots\dots ② \end{cases}$$

②の両辺に6をかけると

$$\begin{aligned} \left(\frac{1}{3}x - \frac{3}{2}y\right) \times 6 &= -11 \times 6 \\ 2x - 9y &= -66 \quad \dots\dots ③ \end{aligned}$$

$$① \times 2 \quad -2x - 2y = 0$$

$$③ \quad \quad \quad +) \quad \underline{2x - 9y = -66}$$

$$-11y = -66$$

$$y = 6$$

$y = 6$ を①に代入すると

$$-x - y = 0$$

$$-x - 1 \times 6 = 0$$

$$-x - 6 = 0$$

$$-x = 6$$

$$x = -6$$

答え $x = -6, y = 6$

$$\begin{cases} -x - y = 3 & \dots\dots ① \\ \frac{1}{3}x + \frac{1}{2}y = 1 & \dots\dots ② \end{cases}$$

②の両辺に6をかけると

$$\begin{aligned} \left(\frac{1}{3}x + \frac{1}{2}y\right) \times 6 &= 1 \times 6 \\ 2x + 3y &= 6 \quad \dots\dots ③ \end{aligned}$$

$$① \times 2 \quad -2x - 2y = 6$$

$$③ \quad \quad \quad +) \quad \underline{2x + 3y = 6}$$

$$y = 12$$

$$y = 12$$

$y = 12$ を①に代入すると

$$-x - y = 3$$

$$-x - 1 \times 12 = 3$$

$$-x - 12 = 3$$

$$-x = 15$$

$$x = -15$$

答え $x = -15, y = 12$

$$\begin{cases} -\frac{2}{3}x - y = 11 \\ \frac{2}{45}x - \frac{1}{15}y = 1 \end{cases}$$

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

$$\begin{cases} -\frac{2}{3}x - y = 11 & \dots\dots ① \\ \frac{2}{45}x - \frac{1}{15}y = 1 & \dots\dots ② \end{cases}$$

①の両辺に3をかけると

$$\left(-\frac{2}{3}x - y\right) \times 3 = 11 \times 3$$

$$-2x - 3y = 33 \quad \dots\dots ③$$

②の両辺に45をかけると

$$\left(\frac{2}{45}x - \frac{1}{15}y\right) \times 45 = 1 \times 45$$

$$2x - 3y = 45 \quad \dots\dots ④$$

$$\begin{array}{r} ③ \quad -2x - 3y = 33 \\ ④ \quad +) \quad 2x - 3y = 45 \\ \hline \quad \quad -6y = 78 \\ \quad \quad \quad y = -13 \end{array}$$

$y = -13$ を③に代入すると

$$-2x - 3y = 33$$

$$-2x - 3 \times (-13) = 33$$

$$-2x + 39 = 33$$

$$-2x = -6$$

$$x = 3$$

答え $x = 3, y = -13$

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

①の両辺に4をかけると

$$\left(-\frac{1}{2}x + \frac{1}{4}y\right) \times 4 = 3 \times 4$$

$$-2x + y = 12 \quad \dots\dots ③$$

②の両辺に8をかけると

$$\left(\frac{1}{8}x + \frac{1}{4}y\right) \times 8 = -2 \times 8$$

$$x + 2y = -16 \quad \dots\dots ④$$

$$\begin{array}{r} ③ \quad -2x + y = 12 \\ ④ \times 2 \quad +) \quad 2x + 4y = -32 \\ \hline \quad \quad 5y = -20 \\ \quad \quad \quad y = -4 \end{array}$$

$y = -4$ を③に代入すると

$$-2x + y = 12$$

$$-2x + 1 \times (-4) = 12$$

$$-2x - 4 = 12$$

$$-2x = 16$$

$$x = -8$$

答え $x = -8, y = -4$

$$\begin{cases} -\frac{1}{12}x + \frac{1}{6}y = -1 \\ 3x + y = -20 \end{cases}$$

$$\begin{cases} -\frac{1}{18}x - \frac{1}{9}y = 1 \\ -\frac{1}{2}x + y = -1 \end{cases}$$

$$\begin{cases} -\frac{1}{12}x + \frac{1}{6}y = -1 & \dots\dots ① \\ 3x + y = -20 & \dots\dots ② \end{cases}$$

①の両辺に12をかけると

$$\begin{aligned} \left(-\frac{1}{12}x + \frac{1}{6}y\right) \times 12 &= -1 \times 12 \\ -x + 2y &= -12 & \dots\dots ③ \end{aligned}$$

$$③ \quad -x + 2y = -12$$

$$② \times 2 \quad -) \quad \frac{6x + 2y = -40}{-7x \quad \quad = 28}$$

$$x = -4$$

$x = -4$ を③に代入すると

$$-x + 2y = -12$$

$$-1 \times (-4) + 2y = -12$$

$$4 + 2y = -12$$

$$2y = -16$$

$$y = -8$$

答え $x = -4, y = -8$

$$\begin{cases} -\frac{1}{18}x - \frac{1}{9}y = 1 & \dots\dots ① \\ -\frac{1}{2}x + y = -1 & \dots\dots ② \end{cases}$$

①の両辺に18をかけると

$$\begin{aligned} \left(-\frac{1}{18}x - \frac{1}{9}y\right) \times 18 &= 1 \times 18 \\ -x - 2y &= 18 & \dots\dots ③ \end{aligned}$$

②の両辺に2をかけると

$$\begin{aligned} \left(-\frac{1}{2}x + y\right) \times 2 &= -1 \times 2 \\ -x + 2y &= -2 & \dots\dots ④ \end{aligned}$$

$$③ \quad -x - 2y = 18$$

$$④ \quad -) \quad \frac{-x + 2y = -2}{-4y = 20}$$

$$y = -5$$

$y = -5$ を④に代入すると

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

$$-x + 2 \times (-5) = -2$$

$$-x - 10 = -2$$

$$-x = 8$$

$$x = -8$$

答え $x = -8, y = -5$

$$\begin{cases} -\frac{1}{2}x - y = -3 \\ \frac{3}{2}x - 2y = 19 \end{cases}$$

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

$$\begin{cases} -\frac{1}{2}x - y = -3 & \dots\dots ① \\ \frac{3}{2}x - 2y = 19 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

$$\begin{aligned} \left(-\frac{1}{2}x - y\right) \times 2 &= -3 \times 2 \\ -x - 2y &= -6 & \dots\dots ③ \end{aligned}$$

②の両辺に2をかけると

$$\begin{aligned} \left(\frac{3}{2}x - 2y\right) \times 2 &= 19 \times 2 \\ 3x - 4y &= 38 & \dots\dots ④ \end{aligned}$$

$$③ \times 2 \quad -2x - 4y = -12$$

$$④ \quad \begin{array}{r} -) \quad 3x - 4y = 38 \\ \underline{-5x} \quad \quad = -50 \end{array}$$

$$x = 10$$

$x = 10$ を③に代入すると

$$\begin{aligned} -x - 2y &= -6 \\ -1 \times 10 - 2y &= -6 \\ -10 - 2y &= -6 \\ -2y &= 4 \\ y &= -2 \end{aligned}$$

答え $x = 10, y = -2$

$$\begin{cases} -\frac{1}{4}x - \frac{2}{5}y = -1 & \dots\dots ① \\ -\frac{2}{3}x - y = -3 & \dots\dots ② \end{cases}$$

①の両辺に20をかけると

$$\begin{aligned} \left(-\frac{1}{4}x - \frac{2}{5}y\right) \times 20 &= -1 \times 20 \\ -5x - 8y &= -20 & \dots\dots ③ \end{aligned}$$

②の両辺に3をかけると

$$\begin{aligned} \left(-\frac{2}{3}x - y\right) \times 3 &= -3 \times 3 \\ -2x - 3y &= -9 & \dots\dots ④ \end{aligned}$$

$$③ \times 2 \quad -10x - 16y = -40$$

$$④ \times 5 \quad \begin{array}{r} -) \quad -10x - 15y = -45 \\ \underline{-y} \quad \quad = 5 \end{array}$$

$$y = -5$$

$y = -5$ を④に代入すると

$$\begin{aligned} -2x - 3y &= -9 \\ -2x - 3 \times (-5) &= -9 \\ -2x + 15 &= -9 \\ -2x &= -24 \\ x &= 12 \end{aligned}$$

答え $x = 12, y = -5$

$$\begin{cases} -\frac{1}{6}x - \frac{1}{4}y = -2 \\ \frac{1}{3}x - \frac{1}{2}y = 2 \end{cases}$$

$$\begin{cases} -\frac{1}{5}x + \frac{1}{10}y = 1 \\ \frac{1}{3}x - \frac{1}{9}y = -2 \end{cases}$$

$$\begin{cases} -\frac{1}{6}x - \frac{1}{4}y = -2 & \dots\dots ① \\ \frac{1}{3}x - \frac{1}{2}y = 2 & \dots\dots ② \end{cases}$$

①の両辺に12をかけると

$$\begin{aligned} \left(-\frac{1}{6}x - \frac{1}{4}y\right) \times 12 &= -2 \times 12 \\ -2x - 3y &= -24 & \dots\dots ③ \end{aligned}$$

②の両辺に6をかけると

$$\begin{aligned} \left(\frac{1}{3}x - \frac{1}{2}y\right) \times 6 &= 2 \times 6 \\ 2x - 3y &= 12 & \dots\dots ④ \end{aligned}$$

$$③ \quad -2x - 3y = -24$$

$$④ \quad \begin{array}{r} +) \quad 2x - 3y = 12 \\ \hline -6y = -12 \end{array}$$

$$y = 2$$

$y = 2$ を④に代入すると

$$\begin{aligned} 2x - 3y &= 12 \\ 2x - 3 \times 2 &= 12 \\ 2x - 6 &= 12 \\ 2x &= 18 \\ x &= 9 \end{aligned}$$

答え $x = 9, y = 2$

$$\begin{cases} -\frac{1}{5}x + \frac{1}{10}y = 1 & \dots\dots ① \\ \frac{1}{3}x - \frac{1}{9}y = -2 & \dots\dots ② \end{cases}$$

①の両辺に10をかけると

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

②の両辺に9をかけると

$$\begin{aligned} \left(\frac{1}{3}x - \frac{1}{9}y\right) \times 9 &= -2 \times 9 \\ 3x - y &= -18 & \dots\dots ④ \end{aligned}$$

$$③ \quad -2x + y = 10$$

$$④ \quad \begin{array}{r} +) \quad 3x - y = -18 \\ \hline x = -8 \end{array}$$

$$x = -8$$

$x = -8$ を③に代入すると

$$\begin{aligned} -2x + y &= 10 \\ -2 \times (-8) + y &= 10 \\ 16 + y &= 10 \\ y &= -6 \end{aligned}$$

答え $x = -8, y = -6$

$$\begin{cases} -\frac{1}{3}x - \frac{3}{2}y = -5 \\ -\frac{1}{6}x - \frac{1}{2}y = -2 \end{cases}$$

$$\begin{cases} \frac{1}{2}x + \frac{1}{4}y = 3 \\ \frac{2}{5}x + \frac{1}{10}y = 1 \end{cases}$$

$$\begin{cases} -\frac{1}{3}x - \frac{3}{2}y = -5 & \dots\dots ① \\ -\frac{1}{6}x - \frac{1}{2}y = -2 & \dots\dots ② \end{cases}$$

①の両辺に6をかけると

$$\begin{aligned} \left(-\frac{1}{3}x - \frac{3}{2}y\right) \times 6 &= -5 \times 6 \\ -2x - 9y &= -30 & \dots\dots ③ \end{aligned}$$

②の両辺に6をかけると

$$\begin{aligned} \left(-\frac{1}{6}x - \frac{1}{2}y\right) \times 6 &= -2 \times 6 \\ -x - 3y &= -12 & \dots\dots ④ \end{aligned}$$

$$③ \quad -2x - 9y = -30$$

$$\begin{array}{r} ④ \times 2 \quad -) -2x - 6y = -24 \\ \hline -3y = -6 \\ y = 2 \end{array}$$

$y = 2$ を④に代入すると

$$\begin{aligned} -x - 3y &= -12 \\ -x - 3 \times 2 &= -12 \\ -x - 6 &= -12 \\ -x &= -6 \\ x &= 6 \end{aligned}$$

答え $x = 6, y = 2$

$$\begin{cases} \frac{1}{2}x + \frac{1}{4}y = 3 & \dots\dots ① \\ \frac{2}{5}x + \frac{1}{10}y = 1 & \dots\dots ② \end{cases}$$

①の両辺に4をかけると

$$\begin{aligned} \left(\frac{1}{2}x + \frac{1}{4}y\right) \times 4 &= 3 \times 4 \\ 2x + y &= 12 & \dots\dots ③ \end{aligned}$$

②の両辺に10をかけると

$$\begin{aligned} \left(\frac{2}{5}x + \frac{1}{10}y\right) \times 10 &= 1 \times 10 \\ 4x + y &= 10 & \dots\dots ④ \end{aligned}$$

$$③ \quad 2x + y = 12$$

$$\begin{array}{r} ④ \quad -) 4x + y = 10 \\ \hline -2x = 2 \\ x = -1 \end{array}$$

$x = -1$ を③に代入すると

$$\begin{aligned} 2x + y &= 12 \\ 2 \times (-1) + y &= 12 \\ -2 + y &= 12 \\ y &= 14 \end{aligned}$$

答え $x = -1, y = 14$

$$\begin{cases} -x - y = -4 \\ -\frac{1}{34}x + \frac{1}{17}y = -1 \end{cases}$$

$$\begin{cases} -\frac{3}{2}x + y = 4 \\ x + y = -16 \end{cases}$$

$$\begin{cases} -x - y = -4 & \dots\dots ① \\ -\frac{1}{34}x + \frac{1}{17}y = -1 & \dots\dots ② \end{cases}$$

$$\begin{cases} -\frac{3}{2}x + y = 4 & \dots\dots ① \\ x + y = -16 & \dots\dots ② \end{cases}$$

②の両辺に34をかけると

$$\begin{aligned} \left(-\frac{1}{34}x + \frac{1}{17}y\right) \times 34 &= -1 \times 34 \\ -x + 2y &= -34 \quad \dots\dots ③ \end{aligned}$$

①の両辺に2をかけると

$$\begin{aligned} \left(-\frac{3}{2}x + y\right) \times 2 &= 4 \times 2 \\ -3x + 2y &= 8 \quad \dots\dots ③ \end{aligned}$$

$$① \quad -x - y = -4$$

$$③ \quad \begin{array}{r} -) -x + 2y = -34 \\ \underline{-3y = 30} \end{array}$$

$$y = -10$$

$y = -10$ を①に代入すると

$$-x - y = -4$$

$$-x - 1 \times (-10) = -4$$

$$-x + 10 = -4$$

$$-x = -14$$

$$x = 14$$

答え $x = 14, y = -10$

$$③ \quad -3x + 2y = 8$$

$$② \times 2 \quad \begin{array}{r} -) 2x + 2y = -32 \\ \underline{-5x = 40} \end{array}$$

$$x = -8$$

$x = -8$ を②に代入すると

$$x + y = -16$$

$$1 \times (-8) + y = -16$$

$$-8 + y = -16$$

$$y = -8$$

答え $x = -8, y = -8$

$$\begin{cases} -\frac{3}{2}x - \frac{1}{3}y = -9 \\ -x - \frac{1}{3}y = -5 \end{cases}$$

$$\begin{cases} x - 2y = 4 \\ 2x - \frac{3}{2}y = 13 \end{cases}$$

$$\begin{cases} -\frac{3}{2}x - \frac{1}{3}y = -9 & \dots\dots ① \\ -x - \frac{1}{3}y = -5 & \dots\dots ② \end{cases}$$

①の両辺に6をかけると

$$\begin{aligned} \left(-\frac{3}{2}x - \frac{1}{3}y\right) \times 6 &= -9 \times 6 \\ -9x - 2y &= -54 & \dots\dots ③ \end{aligned}$$

②の両辺に3をかけると

$$\begin{aligned} \left(-x - \frac{1}{3}y\right) \times 3 &= -5 \times 3 \\ -3x - y &= -15 & \dots\dots ④ \end{aligned}$$

$$③ \quad -9x - 2y = -54$$

$$④ \times 2 \quad \begin{array}{r} -6x - 2y = -30 \\ \underline{-3x} \quad \quad = -24 \end{array}$$

$$x = 8$$

$x = 8$ を④に代入すると

$$\begin{aligned} -3x - y &= -15 \\ -3 \times 8 - y &= -15 \\ -24 - y &= -15 \\ -y &= 9 \\ y &= -9 \end{aligned}$$

答え $x = 8, y = -9$

$$\begin{cases} x - 2y = 4 & \dots\dots ① \\ 2x - \frac{3}{2}y = 13 & \dots\dots ② \end{cases}$$

②の両辺に2をかけると

$$\begin{aligned} \left(2x - \frac{3}{2}y\right) \times 2 &= 13 \times 2 \\ 4x - 3y &= 26 & \dots\dots ③ \end{aligned}$$

$$① \times 4 \quad 4x - 8y = 16$$

$$③ \quad \begin{array}{r} -4x - 3y = 26 \\ \underline{-5y} = -10 \end{array}$$

$$y = 2$$

$y = 2$ を①に代入すると

$$x - 2y = 4$$

$$x - 2 \times 2 = 4$$

$$x - 4 = 4$$

$$x = 8$$

答え $x = 8, y = 2$

$$\begin{cases} -x - y = 2 \\ \frac{2}{31}x - \frac{1}{62}y = 1 \end{cases}$$

$$\begin{cases} -\frac{3}{2}x + y = 2 \\ 2x - \frac{1}{2}y = -6 \end{cases}$$

$$\begin{cases} -x - y = 2 & \dots\dots ① \\ \frac{2}{31}x - \frac{1}{62}y = 1 & \dots\dots ② \end{cases}$$

②の両辺に62をかけると

$$\left(\frac{2}{31}x - \frac{1}{62}y\right) \times 62 = 1 \times 62$$

$$4x - y = 62 \quad \dots\dots ③$$

$$① \quad -x - y = 2$$

$$③ \quad -) \quad \frac{4x - y = 62}{-5x \quad \quad = -60}$$

$$x = 12$$

$x = 12$ を①に代入すると

$$-x - y = 2$$

$$-1 \times 12 - y = 2$$

$$-12 - y = 2$$

$$-y = 14$$

$$y = -14$$

答え $x = 12, y = -14$

$$\begin{cases} -\frac{3}{2}x + y = 2 & \dots\dots ① \\ 2x - \frac{1}{2}y = -6 & \dots\dots ② \end{cases}$$

①の両辺に2をかけると

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

$$-3x + 2y = 4 \quad \dots\dots ③$$

②の両辺に2をかけると

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

$$4x - y = -12 \quad \dots\dots ④$$

$$③ \quad -3x + 2y = 4$$

$$④ \times 2 \quad +) \quad \frac{8x - 2y = -24}{5x \quad \quad = -20}$$

$$x = -4$$

$x = -4$ を③に代入すると

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

$$-3 \times (-4) + 2y = 4$$

$$12 + 2y = 4$$

$$2y = -8$$

$$y = -4$$

答え $x = -4, y = -4$