

すきプリ 中学数学

一次方程式の計算【分数】

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一次方程式の計算【分数】

一次方程式の計算【分子が一次式の分数】

一次方程式の計算【分数まとめ】

問題

次の方程式を解きましょう。

①

$$\frac{9}{4}x - \frac{2}{5} = \frac{3}{2}x - \frac{17}{5}$$

②

$$\frac{3}{5}x - \frac{5}{4} = \frac{4}{5}x - \frac{13}{20}$$

1

$$\begin{aligned}\frac{9}{4}x - \frac{2}{5} &= \frac{3}{2}x - \frac{17}{5} \\ \left(\frac{9}{4}x - \frac{2}{5}\right) \times 20 &= \left(\frac{3}{2}x - \frac{17}{5}\right) \times 20 \\ \frac{9}{4}x \times 20 - \frac{2}{5} \times 20 &= \frac{3}{2}x \times 20 - \frac{17}{5} \times 20 \\ 9x \times 5 - 2 \times 4 &= 3x \times 10 - 17 \times 4 \\ 45x - 8 &= 30x - 68 \\ 45x - 30x &= -68 + 8 \\ 15x &= -60 \\ 15x \div 15 &= -60 \div 15 \\ x &= -4\end{aligned}$$

2

$$\begin{aligned}\frac{3}{5}x - \frac{5}{4} &= \frac{4}{5}x - \frac{13}{20} \\ \left(\frac{3}{5}x - \frac{5}{4}\right) \times 20 &= \left(\frac{4}{5}x - \frac{13}{20}\right) \times 20 \\ \frac{3}{5}x \times 20 - \frac{5}{4} \times 20 &= \frac{4}{5}x \times 20 - \frac{13}{20} \times 20 \\ 3x \times 4 - 5 \times 5 &= 4x \times 4 - 13 \times 1 \\ 12x - 25 &= 16x - 13 \\ 12x - 16x &= -13 + 25 \\ -4x &= 12 \\ -4x \div (-4) &= 12 \div (-4) \\ x &= -3\end{aligned}$$

①

$$-x - \frac{1}{6} = -\frac{5}{3}x - \frac{5}{6}$$

②

$$\frac{17}{12}x + \frac{1}{5} = \frac{3}{4}x - \frac{9}{5}$$

1

$$\begin{aligned} -x - \frac{1}{6} &= -\frac{5}{3}x - \frac{5}{6} \\ \left(-x - \frac{1}{6}\right) \times 6 &= \left(-\frac{5}{3}x - \frac{5}{6}\right) \times 6 \\ -x \times 6 - \frac{1}{6} \times 6 &= -\frac{5}{3}x \times 6 - \frac{5}{6} \times 6 \\ -x \times 6 - 1 \times 1 &= -5x \times 2 - 5 \times 1 \\ -6x - 1 &= -10x - 5 \\ -6x + 10x &= -5 + 1 \\ 4x &= -4 \\ 4x \div 4 &= -4 \div 4 \\ x &= -1 \end{aligned}$$

2

$$\begin{aligned} \frac{17}{12}x + \frac{1}{5} &= \frac{3}{4}x - \frac{9}{5} \\ \left(\frac{17}{12}x + \frac{1}{5}\right) \times 60 &= \left(\frac{3}{4}x - \frac{9}{5}\right) \times 60 \\ \frac{17}{12}x \times 60 + \frac{1}{5} \times 60 &= \frac{3}{4}x \times 60 - \frac{9}{5} \times 60 \\ 17x \times 5 + 1 \times 12 &= 3x \times 15 - 9 \times 12 \\ 85x + 12 &= 45x - 108 \\ 85x - 45x &= -108 - 12 \\ 40x &= -120 \\ 40x \div 40 &= -120 \div 40 \\ x &= -3 \end{aligned}$$

①

$$\frac{1}{6}x + \frac{1}{3} = -\frac{3}{2}x + 12$$

②

$$-\frac{9}{14}x - \frac{5}{8} = -\frac{1}{7}x + \frac{27}{8}$$

1

$$\frac{1}{6}x + \frac{1}{3} = -\frac{3}{2}x + 12$$

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

$$\frac{1}{6}x \times 6 + \frac{1}{3} \times 6 = -\frac{3}{2}x \times 6 + 12 \times 6$$

$$x \times 1 + 1 \times 2 = -3x \times 3 + 12 \times 6$$

$$x + 2 = -9x + 72$$

$$x + 9x = 72 - 2$$

$$10x = 70$$

$$10x \div 10 = 70 \div 10$$

$$x = 7$$

2

$$-\frac{9}{14}x - \frac{5}{8} = -\frac{1}{7}x + \frac{27}{8}$$

$$\left(-\frac{9}{14}x - \frac{5}{8}\right) \times 56 = \left(-\frac{1}{7}x + \frac{27}{8}\right) \times 56$$

$$-\frac{9}{14}x \times 56 - \frac{5}{8} \times 56 = -\frac{1}{7}x \times 56 + \frac{27}{8} \times 56$$

$$-9x \times 4 - 5 \times 7 = -x \times 8 + 27 \times 7$$

$$-36x - 35 = -8x + 189$$

$$-36x + 8x = 189 + 35$$

$$-28x = 224$$

$$-28x \div (-28) = 224 \div (-28)$$

$$x = -8$$

①

$$\frac{1}{12}x - \frac{3}{5} = -\frac{1}{6}x - \frac{21}{10}$$

②

$$\frac{19}{28}x - \frac{5}{6} = \frac{3}{7}x - \frac{1}{12}$$

1

$$\begin{aligned}\frac{1}{12}x - \frac{3}{5} &= -\frac{1}{6}x - \frac{21}{10} \\ \left(\frac{1}{12}x - \frac{3}{5}\right) \times 60 &= \left(-\frac{1}{6}x - \frac{21}{10}\right) \times 60 \\ \frac{1}{12}x \times 60 - \frac{3}{5} \times 60 &= -\frac{1}{6}x \times 60 - \frac{21}{10} \times 60 \\ x \times 5 - 3 \times 12 &= -x \times 10 - 21 \times 6 \\ 5x - 36 &= -10x - 126 \\ 5x + 10x &= -126 + 36 \\ 15x &= -90 \\ 15x \div 15 &= -90 \div 15 \\ x &= -6\end{aligned}$$

2

$$\begin{aligned}\frac{19}{28}x - \frac{5}{6} &= \frac{3}{7}x - \frac{1}{12} \\ \left(\frac{19}{28}x - \frac{5}{6}\right) \times 84 &= \left(\frac{3}{7}x - \frac{1}{12}\right) \times 84 \\ \frac{19}{28}x \times 84 - \frac{5}{6} \times 84 &= \frac{3}{7}x \times 84 - \frac{1}{12} \times 84 \\ 19x \times 3 - 5 \times 14 &= 3x \times 12 - 1 \times 7 \\ 57x - 70 &= 36x - 7 \\ 57x - 36x &= -7 + 70 \\ 21x &= 63 \\ 21x \div 21 &= 63 \div 21 \\ x &= 3\end{aligned}$$

①

$$\frac{15}{28}x - \frac{4}{7} = \frac{1}{4}x - \frac{2}{7}$$

②

$$-\frac{11}{24}x + \frac{1}{6} = -\frac{5}{6}x + \frac{19}{6}$$

1

$$\frac{15}{28}x - \frac{4}{7} = \frac{1}{4}x - \frac{2}{7}$$

$$\left(\frac{15}{28}x - \frac{4}{7}\right) \times 28 = \left(\frac{1}{4}x - \frac{2}{7}\right) \times 28$$

$$\frac{15}{28}x \times 28 - \frac{4}{7} \times 28 = \frac{1}{4}x \times 28 - \frac{2}{7} \times 28$$

$$15x \times 1 - 4 \times 4 = x \times 7 - 2 \times 4$$

$$15x - 16 = 7x - 8$$

$$15x - 7x = -8 + 16$$

$$8x = 8$$

$$8x \div 8 = 8 \div 8$$

$$x = 1$$

2

$$-\frac{11}{24}x + \frac{1}{6} = -\frac{5}{6}x + \frac{19}{6}$$

$$\left(-\frac{11}{24}x + \frac{1}{6}\right) \times 24 = \left(-\frac{5}{6}x + \frac{19}{6}\right) \times 24$$

$$-\frac{11}{24}x \times 24 + \frac{1}{6} \times 24 = -\frac{5}{6}x \times 24 + \frac{19}{6} \times 24$$

$$-11x \times 1 + 1 \times 4 = -5x \times 4 + 19 \times 4$$

$$-11x + 4 = -20x + 76$$

$$-11x + 20x = 76 - 4$$

$$9x = 72$$

$$9x \div 9 = 72 \div 9$$

$$x = 8$$

①

$$3x + \frac{1}{4} = \frac{3}{2}x - \frac{17}{4}$$

②

$$\frac{15}{8}x - \frac{1}{4} = -\frac{5}{8}x + \frac{29}{4}$$

1

$$3x + \frac{1}{4} = \frac{3}{2}x - \frac{17}{4}$$

$$\left(3x + \frac{1}{4}\right) \times 4 = \left(\frac{3}{2}x - \frac{17}{4}\right) \times 4$$

$$3x \times 4 + \frac{1}{4} \times 4 = \frac{3}{2}x \times 4 - \frac{17}{4} \times 4$$

$$3x \times 4 + 1 \times 1 = 3x \times 2 - 17 \times 1$$

$$12x + 1 = 6x - 17$$

$$12x - 6x = -17 - 1$$

$$6x = -18$$

$$6x \div 6 = -18 \div 6$$

$$x = -3$$

2

$$\frac{15}{8}x - \frac{1}{4} = -\frac{5}{8}x + \frac{29}{4}$$

$$\left(\frac{15}{8}x - \frac{1}{4}\right) \times 8 = \left(-\frac{5}{8}x + \frac{29}{4}\right) \times 8$$

$$\frac{15}{8}x \times 8 - \frac{1}{4} \times 8 = -\frac{5}{8}x \times 8 + \frac{29}{4} \times 8$$

$$15x \times 1 - 1 \times 2 = -5x \times 1 + 29 \times 2$$

$$15x - 2 = -5x + 58$$

$$15x + 5x = 58 + 2$$

$$20x = 60$$

$$20x \div 20 = 60 \div 20$$

$$x = 3$$

1

$$-\frac{19}{12}x - \frac{5}{4} = -\frac{5}{4}x + \frac{3}{4}$$

2

$$-2x - \frac{1}{3} = -\frac{5}{3}x - 2$$

1

$$\begin{aligned}-\frac{19}{12}x - \frac{5}{4} &= -\frac{5}{4}x + \frac{3}{4} \\ \left(-\frac{19}{12}x - \frac{5}{4}\right) \times 12 &= \left(-\frac{5}{4}x + \frac{3}{4}\right) \times 12 \\ -\frac{19}{12}x \times 12 - \frac{5}{4} \times 12 &= -\frac{5}{4}x \times 12 + \frac{3}{4} \times 12 \\ -19x \times 1 - 5 \times 3 &= -5x \times 3 + 3 \times 3 \\ -19x - 15 &= -15x + 9 \\ -19x + 15x &= 9 + 15 \\ -4x &= 24 \\ -4x \div (-4) &= 24 \div (-4) \\ x &= -6\end{aligned}$$

2

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

1

$$-\frac{17}{14}x - \frac{1}{2} = \frac{2}{7}x - \frac{25}{2}$$

2

$$-\frac{23}{12}x + \frac{2}{7} = -\frac{5}{4}x - \frac{8}{21}$$

1

$$\begin{aligned}
-\frac{17}{14}x - \frac{1}{2} &= \frac{2}{7}x - \frac{25}{2} \\
\left(-\frac{17}{14}x - \frac{1}{2}\right) \times 14 &= \left(\frac{2}{7}x - \frac{25}{2}\right) \times 14 \\
-\frac{17}{14}x \times 14 - \frac{1}{2} \times 14 &= \frac{2}{7}x \times 14 - \frac{25}{2} \times 14 \\
-17x \times 1 - 1 \times 7 &= 2x \times 2 - 25 \times 7 \\
-17x - 7 &= 4x - 175 \\
-17x - 4x &= -175 + 7 \\
-21x &= -168 \\
-21x \div (-21) &= -168 \div (-21) \\
x &= 8
\end{aligned}$$

2

$$\begin{aligned}
-\frac{23}{12}x + \frac{2}{7} &= -\frac{5}{4}x - \frac{8}{21} \\
\left(-\frac{23}{12}x + \frac{2}{7}\right) \times 84 &= \left(-\frac{5}{4}x - \frac{8}{21}\right) \times 84 \\
-\frac{23}{12}x \times 84 + \frac{2}{7} \times 84 &= -\frac{5}{4}x \times 84 - \frac{8}{21} \times 84 \\
-23x \times 7 + 2 \times 12 &= -5x \times 21 - 8 \times 4 \\
-161x + 24 &= -105x - 32 \\
-161x + 105x &= -32 - 24 \\
-56x &= -56 \\
-56x \div (-56) &= -56 \div (-56) \\
x &= 1
\end{aligned}$$

①

$$-\frac{7}{4}x - \frac{2}{5} = -\frac{5}{2}x - \frac{17}{5}$$

②

$$\frac{29}{20}x + \frac{4}{5} = \frac{5}{4}x + \frac{11}{5}$$

1

$$\begin{aligned}-\frac{7}{4}x - \frac{2}{5} &= -\frac{5}{2}x - \frac{17}{5} \\ \left(-\frac{7}{4}x - \frac{2}{5}\right) \times 20 &= \left(-\frac{5}{2}x - \frac{17}{5}\right) \times 20 \\ -\frac{7}{4}x \times 20 - \frac{2}{5} \times 20 &= -\frac{5}{2}x \times 20 - \frac{17}{5} \times 20 \\ -7x \times 5 - 2 \times 4 &= -5x \times 10 - 17 \times 4 \\ -35x - 8 &= -50x - 68 \\ -35x + 50x &= -68 + 8 \\ 15x &= -60 \\ 15x \div 15 &= -60 \div 15 \\ x &= -4\end{aligned}$$

2

$$\begin{aligned}\frac{29}{20}x + \frac{4}{5} &= \frac{5}{4}x + \frac{11}{5} \\ \left(\frac{29}{20}x + \frac{4}{5}\right) \times 20 &= \left(\frac{5}{4}x + \frac{11}{5}\right) \times 20 \\ \frac{29}{20}x \times 20 + \frac{4}{5} \times 20 &= \frac{5}{4}x \times 20 + \frac{11}{5} \times 20 \\ 29x \times 1 + 4 \times 4 &= 5x \times 5 + 11 \times 4 \\ 29x + 16 &= 25x + 44 \\ 29x - 25x &= 44 - 16 \\ 4x &= 28 \\ 4x \div 4 &= 28 \div 4 \\ x &= 7\end{aligned}$$

①

$$-\frac{29}{12}x - \frac{3}{8} = -\frac{5}{3}x - \frac{27}{8}$$

②

$$\frac{13}{8}x - \frac{1}{4} = \frac{1}{8}x - \frac{19}{4}$$

1

$$\begin{aligned}
-\frac{29}{12}x - \frac{3}{8} &= -\frac{5}{3}x - \frac{27}{8} \\
\left(-\frac{29}{12}x - \frac{3}{8}\right) \times 24 &= \left(-\frac{5}{3}x - \frac{27}{8}\right) \times 24 \\
-\frac{29}{12}x \times 24 - \frac{3}{8} \times 24 &= -\frac{5}{3}x \times 24 - \frac{27}{8} \times 24 \\
-29x \times 2 - 3 \times 3 &= -5x \times 8 - 27 \times 3 \\
-58x - 9 &= -40x - 81 \\
-58x + 40x &= -81 + 9 \\
-18x &= -72 \\
-18x \div (-18) &= -72 \div (-18) \\
x &= 4
\end{aligned}$$

2

$$\begin{aligned}
\frac{13}{8}x - \frac{1}{4} &= \frac{1}{8}x - \frac{19}{4} \\
\left(\frac{13}{8}x - \frac{1}{4}\right) \times 8 &= \left(\frac{1}{8}x - \frac{19}{4}\right) \times 8 \\
\frac{13}{8}x \times 8 - \frac{1}{4} \times 8 &= \frac{1}{8}x \times 8 - \frac{19}{4} \times 8 \\
13x \times 1 - 1 \times 2 &= x \times 1 - 19 \times 2 \\
13x - 2 &= x - 38 \\
13x - x &= -38 + 2 \\
12x &= -36 \\
12x \div 12 &= -36 \div 12 \\
x &= -3
\end{aligned}$$

問題

次の方程式を解きましょう。

①

$$-\frac{-2x-2}{7} = \frac{6x+6}{7}$$

②

$$-\frac{3x+6}{8} = \frac{-x-2}{5}$$

1

$$\begin{aligned}-\frac{-2x-2}{7} &= \frac{6x+6}{7} \\ \frac{-2x-2}{7} \times (-1) \times 7 &= \frac{6x+6}{7} \times 7 \\ (-2x-2) \times (-1) \times 1 &= (6x+6) \times 1 \\ (-2x-2) \times (-1) &= (6x+6) \times 1 \\ 2x+2 &= 6x+6 \\ 2x-6x &= 6-2 \\ -4x &= 4 \\ -4x \div (-4) &= 4 \div (-4) \\ x &= -1\end{aligned}$$

2

$$\begin{aligned}-\frac{3x+6}{8} &= \frac{-x-2}{5} \\ \frac{3x+6}{8} \times (-1) \times 40 &= \frac{-x-2}{5} \times 40 \\ (3x+6) \times (-1) \times 5 &= (-x-2) \times 8 \\ (3x+6) \times (-5) &= (-x-2) \times 8 \\ -15x-30 &= -8x-16 \\ -15x+8x &= -16+30 \\ -7x &= 14 \\ -7x \div (-7) &= 14 \div (-7) \\ x &= -2\end{aligned}$$

①

$$\frac{-2x+2}{3} = \frac{2x+18}{7}$$

②

$$\frac{-6x+3}{5} = -\frac{-2x-1}{3}$$

1

$$\begin{aligned}\frac{-2x+2}{3} &= \frac{2x+18}{7} \\ \frac{-2x+2}{3} \times 21 &= \frac{2x+18}{7} \times 21 \\ (-2x+2) \times 7 &= (2x+18) \times 3 \\ -14x+14 &= 6x+54 \\ -14x-6x &= 54-14 \\ -20x &= 40 \\ -20x \div (-20) &= 40 \div (-20) \\ x &= -2\end{aligned}$$

2

$$\begin{aligned}\frac{-6x+3}{5} &= -\frac{-2x-1}{3} \\ \frac{-6x+3}{5} \times 15 &= \frac{-2x-1}{3} \times (-1) \times 15 \\ (-6x+3) \times 3 &= (-2x-1) \times (-1) \times 5 \\ (-6x+3) \times 3 &= (-2x-1) \times (-5) \\ -18x+9 &= 10x+5 \\ -18x-10x &= 5-9 \\ -28x &= -4 \\ -28x \div (-28) &= -4 \div (-28) \\ x &= \frac{1}{7}\end{aligned}$$

①

$$-\frac{-6x-7}{4} = -\frac{-9x-16}{7}$$

②

$$\frac{9x-9}{2} = -\frac{7x+1}{2}$$

1

$$\begin{aligned} -\frac{-6x-7}{4} &= -\frac{-9x-16}{7} \\ \frac{-6x-7}{4} \times (-1) \times 28 &= \frac{-9x-16}{7} \times (-1) \times 28 \\ (-6x-7) \times (-1) \times 7 &= (-9x-16) \times (-1) \times 4 \\ (-6x-7) \times (-7) &= (-9x-16) \times (-4) \\ 42x+49 &= 36x+64 \\ 42x-36x &= 64-49 \\ 6x &= 15 \\ 6x \div 6 &= 15 \div 6 \\ x &= \frac{5}{2} \end{aligned}$$

2

$$\begin{aligned} \frac{9x-9}{2} &= -\frac{7x+1}{2} \\ \frac{9x-9}{2} \times 2 &= \frac{7x+1}{2} \times (-1) \times 2 \\ (9x-9) \times 1 &= (7x+1) \times (-1) \times 1 \\ (9x-9) \times 1 &= (7x+1) \times (-1) \\ 9x-9 &= -7x-1 \\ 9x+7x &= -1+9 \\ 16x &= 8 \\ 16x \div 16 &= 8 \div 16 \\ x &= \frac{1}{2} \end{aligned}$$

①

$$\frac{-7x-9}{8} = -\frac{-3x+23}{8}$$

②

$$-\frac{2x+9}{3} = \frac{4x-7}{4}$$

1

$$\begin{aligned}\frac{-7x-9}{8} &= -\frac{-3x+23}{8} \\ \frac{-7x-9}{8} \times 8 &= \frac{-3x+23}{8} \times (-1) \times 8 \\ (-7x-9) \times 1 &= (-3x+23) \times (-1) \times 1 \\ (-7x-9) \times 1 &= (-3x+23) \times (-1) \\ -7x-9 &= 3x-23 \\ -7x-3x &= -23+9 \\ -10x &= -14 \\ -10x \div (-10) &= -14 \div (-10) \\ x &= \frac{7}{5}\end{aligned}$$

2

$$\begin{aligned}-\frac{2x+9}{3} &= \frac{4x-7}{4} \\ \frac{2x+9}{3} \times (-1) \times 12 &= \frac{4x-7}{4} \times 12 \\ (2x+9) \times (-1) \times 4 &= (4x-7) \times 3 \\ (2x+9) \times (-4) &= (4x-7) \times 3 \\ -8x-36 &= 12x-21 \\ -8x-12x &= -21+36 \\ -20x &= 15 \\ -20x \div (-20) &= 15 \div (-20) \\ x &= -\frac{3}{4}\end{aligned}$$

①

$$\frac{-2x+5}{3} = \frac{-x+8}{6}$$

②

$$-\frac{11x-7}{8} = -\frac{5x-13}{8}$$

1

$$\begin{aligned}\frac{-2x+5}{3} &= \frac{-x+8}{6} \\ \frac{-2x+5}{3} \times 6 &= \frac{-x+8}{6} \times 6 \\ (-2x+5) \times 2 &= (-x+8) \times 1 \\ -4x+10 &= -x+8 \\ -4x+x &= 8-10 \\ -3x &= -2 \\ -3x \div (-3) &= -2 \div (-3) \\ x &= \frac{2}{3}\end{aligned}$$

2

$$\begin{aligned}-\frac{11x-7}{8} &= -\frac{5x-13}{8} \\ \frac{11x-7}{8} \times (-1) \times 8 &= \frac{5x-13}{8} \times (-1) \times 8 \\ (11x-7) \times (-1) \times 1 &= (5x-13) \times (-1) \times 1 \\ (11x-7) \times (-1) &= (5x-13) \times (-1) \\ -11x+7 &= -5x+13 \\ -11x+5x &= 13-7 \\ -6x &= 6 \\ -6x \div (-6) &= 6 \div (-6) \\ x &= -1\end{aligned}$$

①

$$-\frac{-12x+2}{3} = -\frac{-9x+29}{3}$$

②

$$\frac{5x+2}{8} = -\frac{7x-14}{8}$$

1

$$\begin{aligned} -\frac{-12x+2}{3} &= -\frac{-9x+29}{3} \\ \frac{-12x+2}{3} \times (-1) \times 3 &= \frac{-9x+29}{3} \times (-1) \times 3 \\ (-12x+2) \times (-1) \times 1 &= (-9x+29) \times (-1) \times 1 \\ (-12x+2) \times (-1) &= (-9x+29) \times (-1) \\ 12x-2 &= 9x-29 \\ 12x-9x &= -29+2 \\ 3x &= -27 \\ 3x \div 3 &= -27 \div 3 \\ x &= -9 \end{aligned}$$

2

$$\begin{aligned} \frac{5x+2}{8} &= -\frac{7x-14}{8} \\ \frac{5x+2}{8} \times 8 &= \frac{7x-14}{8} \times (-1) \times 8 \\ (5x+2) \times 1 &= (7x-14) \times (-1) \times 1 \\ (5x+2) \times 1 &= (7x-14) \times (-1) \\ 5x+2 &= -7x+14 \\ 5x+7x &= 14-2 \\ 12x &= 12 \\ 12x \div 12 &= 12 \div 12 \\ x &= 1 \end{aligned}$$

①

$$-\frac{5x-5}{3} = \frac{7x-13}{3}$$

②

$$\frac{-8x-7}{8} = \frac{-7x-8}{2}$$

1

$$-\frac{5x-5}{3} = \frac{7x-13}{3}$$

$$\frac{5x-5}{3} \times (-1) \times 3 = \frac{7x-13}{3} \times 3$$

$$(5x-5) \times (-1) \times 1 = (7x-13) \times 1$$

$$(5x-5) \times (-1) = (7x-13) \times 1$$

$$-5x+5 = 7x-13$$

$$-5x-7x = -13-5$$

$$-12x = -18$$

$$-12x \div (-12) = -18 \div (-12)$$

$$x = \frac{3}{2}$$

2

$$\frac{-8x-7}{8} = \frac{-7x-8}{2}$$

$$\frac{-8x-7}{8} \times 8 = \frac{-7x-8}{2} \times 8$$

$$(-8x-7) \times 1 = (-7x-8) \times 4$$

$$-8x-7 = -28x-32$$

$$-8x+28x = -32+7$$

$$20x = -25$$

$$20x \div 20 = -25 \div 20$$

$$x = -\frac{5}{4}$$

①

$$\frac{-3x-4}{5} = -\frac{-5x-22}{7}$$

②

$$\frac{3x+3}{8} = \frac{x-9}{6}$$

1

$$\begin{aligned}\frac{-3x-4}{5} &= -\frac{-5x-22}{7} \\ \frac{-3x-4}{5} \times 35 &= \frac{-5x-22}{7} \times (-1) \times 35 \\ (-3x-4) \times 7 &= (-5x-22) \times (-1) \times 5 \\ (-3x-4) \times 7 &= (-5x-22) \times (-5) \\ -21x-28 &= 25x+110 \\ -21x-25x &= 110+28 \\ -46x &= 138 \\ -46x \div (-46) &= 138 \div (-46) \\ x &= -3\end{aligned}$$

2

$$\begin{aligned}\frac{3x+3}{8} &= \frac{x-9}{6} \\ \frac{3x+3}{8} \times 24 &= \frac{x-9}{6} \times 24 \\ (3x+3) \times 3 &= (x-9) \times 4 \\ 9x+9 &= 4x-36 \\ 9x-4x &= -36-9 \\ 5x &= -45 \\ 5x \div 5 &= -45 \div 5 \\ x &= -9\end{aligned}$$

①

$$-\frac{-13x+7}{3} = -\frac{-9x+43}{7}$$

②

$$-\frac{4x+9}{7} = -\frac{7x-12}{7}$$

1

$$\begin{aligned}
 -\frac{-13x+7}{3} &= -\frac{-9x+43}{7} \\
 \frac{-13x+7}{3} \times (-1) \times 21 &= \frac{-9x+43}{7} \times (-1) \times 21 \\
 (-13x+7) \times (-1) \times 7 &= (-9x+43) \times (-1) \times 3 \\
 (-13x+7) \times (-7) &= (-9x+43) \times (-3) \\
 91x-49 &= 27x-129 \\
 91x-27x &= -129+49 \\
 64x &= -80 \\
 64x \div 64 &= -80 \div 64 \\
 x &= -\frac{5}{4}
 \end{aligned}$$

2

$$\begin{aligned}
 -\frac{4x+9}{7} &= -\frac{7x-12}{7} \\
 \frac{4x+9}{7} \times (-1) \times 7 &= \frac{7x-12}{7} \times (-1) \times 7 \\
 (4x+9) \times (-1) \times 1 &= (7x-12) \times (-1) \times 1 \\
 (4x+9) \times (-1) &= (7x-12) \times (-1) \\
 -4x-9 &= -7x+12 \\
 -4x+7x &= 12+9 \\
 3x &= 21 \\
 3x \div 3 &= 21 \div 3 \\
 x &= 7
 \end{aligned}$$

①

$$-\frac{11x-5}{9} = -\frac{6x-10}{9}$$

②

$$-\frac{4x-2}{3} = -\frac{x-20}{3}$$

1

$$-\frac{11x-5}{9} = -\frac{6x-10}{9}$$

$$\frac{11x-5}{9} \times (-1) \times 9 = \frac{6x-10}{9} \times (-1) \times 9$$

$$(11x-5) \times (-1) \times 1 = (6x-10) \times (-1) \times 1$$

$$(11x-5) \times (-1) = (6x-10) \times (-1)$$

$$-11x+5 = -6x+10$$

$$-11x+6x = 10-5$$

$$-5x = 5$$

$$-5x \div (-5) = 5 \div (-5)$$

$$x = -1$$

2

$$-\frac{4x-2}{3} = -\frac{x-20}{3}$$

$$\frac{4x-2}{3} \times (-1) \times 3 = \frac{x-20}{3} \times (-1) \times 3$$

$$(4x-2) \times (-1) \times 1 = (x-20) \times (-1) \times 1$$

$$(4x-2) \times (-1) = (x-20) \times (-1)$$

$$-4x+2 = -x+20$$

$$-4x+x = 20-2$$

$$-3x = 18$$

$$-3x \div (-3) = 18 \div (-3)$$

$$x = -6$$

問題

次の方程式を解きましょう。

1

$$-\frac{-x+8}{9} = -\frac{6x-41}{9}$$

2

$$\frac{5}{2}x - \frac{2}{3} = \frac{5}{3}x - \frac{19}{6}$$

1

$$-\frac{-x+8}{9} = -\frac{6x-41}{9}$$

$$\frac{-x+8}{9} \times (-1) \times 9 = \frac{6x-41}{9} \times (-1) \times 9$$

$$(-x+8) \times (-1) \times 1 = (6x-41) \times (-1) \times 1$$

$$(-x+8) \times (-1) = (6x-41) \times (-1)$$

$$x-8 = -6x+41$$

$$x+6x = 41+8$$

$$7x = 49$$

$$7x \div 7 = 49 \div 7$$

$$x = 7$$

2

$$\frac{5}{2}x - \frac{2}{3} = \frac{5}{3}x - \frac{19}{6}$$

$$\left(\frac{5}{2}x - \frac{2}{3}\right) \times 6 = \left(\frac{5}{3}x - \frac{19}{6}\right) \times 6$$

$$\frac{5}{2}x \times 6 - \frac{2}{3} \times 6 = \frac{5}{3}x \times 6 - \frac{19}{6} \times 6$$

$$5x \times 3 - 2 \times 2 = 5x \times 2 - 19 \times 1$$

$$15x - 4 = 10x - 19$$

$$15x - 10x = -19 + 4$$

$$5x = -15$$

$$5x \div 5 = -15 \div 5$$

$$x = -3$$

①

$$\frac{4}{7}x + \frac{5}{2} = \frac{1}{7}x + \frac{11}{14}$$

②

$$\frac{5}{4}x - \frac{1}{8} = \frac{5}{8}x - 2$$

1

$$\begin{aligned}\frac{4}{7}x + \frac{5}{2} &= \frac{1}{7}x + \frac{11}{14} \\ \left(\frac{4}{7}x + \frac{5}{2}\right) \times 14 &= \left(\frac{1}{7}x + \frac{11}{14}\right) \times 14 \\ \frac{4}{7}x \times 14 + \frac{5}{2} \times 14 &= \frac{1}{7}x \times 14 + \frac{11}{14} \times 14 \\ 4x \times 2 + 5 \times 7 &= x \times 2 + 11 \times 1 \\ 8x + 35 &= 2x + 11 \\ 8x - 2x &= 11 - 35 \\ 6x &= -24 \\ 6x \div 6 &= -24 \div 6 \\ x &= -4\end{aligned}$$

2

$$\begin{aligned}\frac{5}{4}x - \frac{1}{8} &= \frac{5}{8}x - 2 \\ \left(\frac{5}{4}x - \frac{1}{8}\right) \times 8 &= \left(\frac{5}{8}x - 2\right) \times 8 \\ \frac{5}{4}x \times 8 - \frac{1}{8} \times 8 &= \frac{5}{8}x \times 8 - 2 \times 8 \\ 5x \times 2 - 1 \times 1 &= 5x \times 1 - 2 \times 8 \\ 10x - 1 &= 5x - 16 \\ 10x - 5x &= -16 + 1 \\ 5x &= -15 \\ 5x \div 5 &= -15 \div 5 \\ x &= -3\end{aligned}$$

①

$$\frac{7x+8}{7} = -\frac{3x-16}{5}$$

②

$$-\frac{7}{15}x - \frac{4}{3} = -\frac{4}{5}x + 1$$

1

$$\begin{aligned} \frac{7x+8}{7} &= -\frac{3x-16}{5} \\ \frac{7x+8}{7} \times 35 &= \frac{3x-16}{5} \times (-1) \times 35 \\ (7x+8) \times 5 &= (3x-16) \times (-1) \times 7 \\ (7x+8) \times 5 &= (3x-16) \times (-7) \\ 35x+40 &= -21x+112 \\ 35x+21x &= 112-40 \\ 56x &= 72 \\ 56x \div 56 &= 72 \div 56 \\ x &= \frac{9}{7} \end{aligned}$$

2

$$\begin{aligned} -\frac{7}{15}x - \frac{4}{3} &= -\frac{4}{5}x + 1 \\ \left(-\frac{7}{15}x - \frac{4}{3}\right) \times 15 &= \left(-\frac{4}{5}x + 1\right) \times 15 \\ -\frac{7}{15}x \times 15 - \frac{4}{3} \times 15 &= -\frac{4}{5}x \times 15 + 1 \times 15 \\ -7x \times 1 - 4 \times 5 &= -4x \times 3 + 1 \times 15 \\ -7x - 20 &= -12x + 15 \\ -7x + 12x &= 15 + 20 \\ 5x &= 35 \\ 5x \div 5 &= 35 \div 5 \\ x &= 7 \end{aligned}$$

1

$$\frac{9x + 5}{4} = -\frac{8x + 3}{8}$$

2

$$\frac{17}{20}x - \frac{4}{5} = \frac{5}{4}x - 4$$

1

$$\begin{aligned}\frac{9x+5}{4} &= -\frac{8x+3}{8} \\ \frac{9x+5}{4} \times 8 &= \frac{8x+3}{8} \times (-1) \times 8 \\ (9x+5) \times 2 &= (8x+3) \times (-1) \times 1 \\ (9x+5) \times 2 &= (8x+3) \times (-1) \\ 18x+10 &= -8x-3 \\ 18x+8x &= -3-10 \\ 26x &= -13 \\ 26x \div 26 &= -13 \div 26 \\ x &= -\frac{1}{2}\end{aligned}$$

2

$$\begin{aligned}\frac{17}{20}x - \frac{4}{5} &= \frac{5}{4}x - 4 \\ \left(\frac{17}{20}x - \frac{4}{5}\right) \times 20 &= \left(\frac{5}{4}x - 4\right) \times 20 \\ \frac{17}{20}x \times 20 - \frac{4}{5} \times 20 &= \frac{5}{4}x \times 20 - 4 \times 20 \\ 17x \times 1 - 4 \times 4 &= 5x \times 5 - 4 \times 20 \\ 17x - 16 &= 25x - 80 \\ 17x - 25x &= -80 + 16 \\ -8x &= -64 \\ -8x \div (-8) &= -64 \div (-8) \\ x &= 8\end{aligned}$$

①

$$\frac{7x + 8}{3} = -\frac{-x - 24}{4}$$

②

$$\frac{4}{21}x + \frac{3}{7} = -\frac{1}{7}x - \frac{26}{21}$$

1

$$\frac{7x+8}{3} = -\frac{-x-24}{4}$$

$$\frac{7x+8}{3} \times 12 = \frac{-x-24}{4} \times (-1) \times 12$$

$$(7x+8) \times 4 = (-x-24) \times (-1) \times 3$$

$$(7x+8) \times 4 = (-x-24) \times (-3)$$

$$28x+32 = 3x+72$$

$$28x-3x = 72-32$$

$$25x = 40$$

$$25x \div 25 = 40 \div 25$$

$$x = \frac{8}{5}$$

2

$$\frac{4}{21}x + \frac{3}{7} = -\frac{1}{7}x - \frac{26}{21}$$

$$\left(\frac{4}{21}x + \frac{3}{7}\right) \times 21 = \left(-\frac{1}{7}x - \frac{26}{21}\right) \times 21$$

$$\frac{4}{21}x \times 21 + \frac{3}{7} \times 21 = -\frac{1}{7}x \times 21 - \frac{26}{21} \times 21$$

$$4x \times 1 + 3 \times 3 = -x \times 3 - 26 \times 1$$

$$4x + 9 = -3x - 26$$

$$4x + 3x = -26 - 9$$

$$7x = -35$$

$$7x \div 7 = -35 \div 7$$

$$x = -5$$

①

$$-\frac{-7x+5}{3} = -\frac{2x-31}{9}$$

②

$$\frac{11}{12}x + \frac{1}{3} = \frac{3}{4}x - \frac{1}{2}$$

1

$$\begin{aligned}-\frac{-7x+5}{3} &= -\frac{2x-31}{9} \\ \frac{-7x+5}{3} \times (-1) \times 9 &= \frac{2x-31}{9} \times (-1) \times 9 \\ (-7x+5) \times (-1) \times 3 &= (2x-31) \times (-1) \times 1 \\ (-7x+5) \times (-3) &= (2x-31) \times (-1) \\ 21x-15 &= -2x+31 \\ 21x+2x &= 31+15 \\ 23x &= 46 \\ 23x \div 23 &= 46 \div 23 \\ x &= 2\end{aligned}$$

2

$$\begin{aligned}\frac{11}{12}x + \frac{1}{3} &= \frac{3}{4}x - \frac{1}{2} \\ \left(\frac{11}{12}x + \frac{1}{3}\right) \times 12 &= \left(\frac{3}{4}x - \frac{1}{2}\right) \times 12 \\ \frac{11}{12}x \times 12 + \frac{1}{3} \times 12 &= \frac{3}{4}x \times 12 - \frac{1}{2} \times 12 \\ 11x \times 1 + 1 \times 4 &= 3x \times 3 - 1 \times 6 \\ 11x + 4 &= 9x - 6 \\ 11x - 9x &= -6 - 4 \\ 2x &= -10 \\ 2x \div 2 &= -10 \div 2 \\ x &= -5\end{aligned}$$

①

$$\frac{4x - 5}{3} = -\frac{2x + 1}{3}$$

②

$$\frac{25}{8}x + \frac{5}{2} = \frac{5}{2}x + \frac{15}{4}$$

1

$$\begin{aligned}\frac{4x-5}{3} &= -\frac{2x+1}{3} \\ \frac{4x-5}{3} \times 3 &= \frac{2x+1}{3} \times (-1) \times 3 \\ (4x-5) \times 1 &= (2x+1) \times (-1) \times 1 \\ (4x-5) \times 1 &= (2x+1) \times (-1) \\ 4x-5 &= -2x-1 \\ 4x+2x &= -1+5 \\ 6x &= 4 \\ 6x \div 6 &= 4 \div 6 \\ x &= \frac{2}{3}\end{aligned}$$

2

$$\begin{aligned}\frac{25}{8}x + \frac{5}{2} &= \frac{5}{2}x + \frac{15}{4} \\ \left(\frac{25}{8}x + \frac{5}{2}\right) \times 8 &= \left(\frac{5}{2}x + \frac{15}{4}\right) \times 8 \\ \frac{25}{8}x \times 8 + \frac{5}{2} \times 8 &= \frac{5}{2}x \times 8 + \frac{15}{4} \times 8 \\ 25x \times 1 + 5 \times 4 &= 5x \times 4 + 15 \times 2 \\ 25x + 20 &= 20x + 30 \\ 25x - 20x &= 30 - 20 \\ 5x &= 10 \\ 5x \div 5 &= 10 \div 5 \\ x &= 2\end{aligned}$$

①

$$-\frac{7x+1}{7} = \frac{9x-13}{7}$$

②

$$-\frac{-x+2}{6} = \frac{-3x-16}{4}$$

1

$$-\frac{7x+1}{7} = \frac{9x-13}{7}$$

$$\frac{7x+1}{7} \times (-1) \times 7 = \frac{9x-13}{7} \times 7$$

$$(7x+1) \times (-1) \times 1 = (9x-13) \times 1$$

$$(7x+1) \times (-1) = (9x-13) \times 1$$

$$-7x-1 = 9x-13$$

$$-7x-9x = -13+1$$

$$-16x = -12$$

$$-16x \div (-16) = -12 \div (-16)$$

$$x = \frac{3}{4}$$

2

$$-\frac{-x+2}{6} = \frac{-3x-16}{4}$$

$$\frac{-x+2}{6} \times (-1) \times 12 = \frac{-3x-16}{4} \times 12$$

$$(-x+2) \times (-1) \times 2 = (-3x-16) \times 3$$

$$(-x+2) \times (-2) = (-3x-16) \times 3$$

$$2x-4 = -9x-48$$

$$2x+9x = -48+4$$

$$11x = -44$$

$$11x \div 11 = -44 \div 11$$

$$x = -4$$

①

$$-\frac{5}{3}x + \frac{2}{7} = -\frac{4}{3}x - \frac{8}{21}$$

②

$$-\frac{-x-2}{9} = -\frac{8x-65}{9}$$

1

$$\begin{aligned}
 -\frac{5}{3}x + \frac{2}{7} &= -\frac{4}{3}x - \frac{8}{21} \\
 \left(-\frac{5}{3}x + \frac{2}{7}\right) \times 21 &= \left(-\frac{4}{3}x - \frac{8}{21}\right) \times 21 \\
 -\frac{5}{3}x \times 21 + \frac{2}{7} \times 21 &= -\frac{4}{3}x \times 21 - \frac{8}{21} \times 21 \\
 -5x \times 7 + 2 \times 3 &= -4x \times 7 - 8 \times 1 \\
 -35x + 6 &= -28x - 8 \\
 -35x + 28x &= -8 - 6 \\
 -7x &= -14 \\
 -7x \div (-7) &= -14 \div (-7) \\
 x &= 2
 \end{aligned}$$

2

$$\begin{aligned}
 -\frac{-x-2}{9} &= -\frac{8x-65}{9} \\
 \frac{-x-2}{9} \times (-1) \times 9 &= \frac{8x-65}{9} \times (-1) \times 9 \\
 (-x-2) \times (-1) \times 1 &= (8x-65) \times (-1) \times 1 \\
 (-x-2) \times (-1) &= (8x-65) \times (-1) \\
 x+2 &= -8x+65 \\
 x+8x &= 65-2 \\
 9x &= 63 \\
 9x \div 9 &= 63 \div 9 \\
 x &= 7
 \end{aligned}$$

①

$$-\frac{-4x-5}{6} = \frac{2x+1}{2}$$

②

$$\frac{25}{28}x - \frac{5}{2} = \frac{1}{7}x + \frac{11}{4}$$

1

$$\begin{aligned}-\frac{-4x-5}{6} &= \frac{2x+1}{2} \\ \frac{-4x-5}{6} \times (-1) \times 6 &= \frac{2x+1}{2} \times 6 \\ (-4x-5) \times (-1) \times 1 &= (2x+1) \times 3 \\ (-4x-5) \times (-1) &= (2x+1) \times 3 \\ 4x+5 &= 6x+3 \\ 4x-6x &= 3-5 \\ -2x &= -2 \\ -2x \div (-2) &= -2 \div (-2) \\ x &= 1\end{aligned}$$

2

$$\begin{aligned}\frac{25}{28}x - \frac{5}{2} &= \frac{1}{7}x + \frac{11}{4} \\ \left(\frac{25}{28}x - \frac{5}{2}\right) \times 28 &= \left(\frac{1}{7}x + \frac{11}{4}\right) \times 28 \\ \frac{25}{28}x \times 28 - \frac{5}{2} \times 28 &= \frac{1}{7}x \times 28 + \frac{11}{4} \times 28 \\ 25x \times 1 - 5 \times 14 &= x \times 4 + 11 \times 7 \\ 25x - 70 &= 4x + 77 \\ 25x - 4x &= 77 + 70 \\ 21x &= 147 \\ 21x \div 21 &= 147 \div 21 \\ x &= 7\end{aligned}$$

1

$$\frac{9x + 7}{2} = -\frac{3x - 11}{4}$$

2

$$\frac{13x - 7}{3} = -\frac{4x - 61}{6}$$

1

$$\begin{aligned}\frac{9x+7}{2} &= -\frac{3x-11}{4} \\ \frac{9x+7}{2} \times 4 &= \frac{3x-11}{4} \times (-1) \times 4 \\ (9x+7) \times 2 &= (3x-11) \times (-1) \times 1 \\ (9x+7) \times 2 &= (3x-11) \times (-1) \\ 18x+14 &= -3x+11 \\ 18x+3x &= 11-14 \\ 21x &= -3 \\ 21x \div 21 &= -3 \div 21 \\ x &= -\frac{1}{7}\end{aligned}$$

2

$$\begin{aligned}\frac{13x-7}{3} &= -\frac{4x-61}{6} \\ \frac{13x-7}{3} \times 6 &= \frac{4x-61}{6} \times (-1) \times 6 \\ (13x-7) \times 2 &= (4x-61) \times (-1) \times 1 \\ (13x-7) \times 2 &= (4x-61) \times (-1) \\ 26x-14 &= -4x+61 \\ 26x+4x &= 61+14 \\ 30x &= 75 \\ 30x \div 30 &= 75 \div 30 \\ x &= \frac{5}{2}\end{aligned}$$

①

$$-\frac{-12x-7}{7} = \frac{-6x+35}{2}$$

②

$$\frac{2x+8}{3} = \frac{6x+4}{5}$$

1

$$\begin{aligned}-\frac{-12x-7}{7} &= \frac{-6x+35}{2} \\ \frac{-12x-7}{7} \times (-1) \times 14 &= \frac{-6x+35}{2} \times 14 \\ (-12x-7) \times (-1) \times 2 &= (-6x+35) \times 7 \\ (-12x-7) \times (-2) &= (-6x+35) \times 7 \\ 24x+14 &= -42x+245 \\ 24x+42x &= 245-14 \\ 66x &= 231 \\ 66x \div 66 &= 231 \div 66 \\ x &= \frac{7}{2}\end{aligned}$$

2

$$\begin{aligned}\frac{2x+8}{3} &= \frac{6x+4}{5} \\ \frac{2x+8}{3} \times 15 &= \frac{6x+4}{5} \times 15 \\ (2x+8) \times 5 &= (6x+4) \times 3 \\ 10x+40 &= 18x+12 \\ 10x-18x &= 12-40 \\ -8x &= -28 \\ -8x \div (-8) &= -28 \div (-8) \\ x &= \frac{7}{2}\end{aligned}$$

①

$$x + \frac{2}{3} = -\frac{1}{3}x - \frac{2}{3}$$

②

$$-\frac{21}{20}x - \frac{1}{4} = -\frac{5}{4}x + \frac{23}{20}$$

1

$$x + \frac{2}{3} = -\frac{1}{3}x - \frac{2}{3}$$

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

$$x \times 3 + \frac{2}{3} \times 3 = -\frac{1}{3}x \times 3 - \frac{2}{3} \times 3$$

$$x \times 3 + 2 \times 1 = -x \times 1 - 2 \times 1$$

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

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

$$4x = -4$$

$$4x \div 4 = -4 \div 4$$

$$x = -1$$

2

$$-\frac{21}{20}x - \frac{1}{4} = -\frac{5}{4}x + \frac{23}{20}$$

$$\left(-\frac{21}{20}x - \frac{1}{4}\right) \times 20 = \left(-\frac{5}{4}x + \frac{23}{20}\right) \times 20$$

$$-\frac{21}{20}x \times 20 - \frac{1}{4} \times 20 = -\frac{5}{4}x \times 20 + \frac{23}{20} \times 20$$

$$-21x \times 1 - 1 \times 5 = -5x \times 5 + 23 \times 1$$

$$-21x - 5 = -25x + 23$$

$$-21x + 25x = 23 + 5$$

$$4x = 28$$

$$4x \div 4 = 28 \div 4$$

$$x = 7$$

①

$$-\frac{x+2}{3} = -\frac{2x+11}{9}$$

②

$$-\frac{-x-6}{2} = -\frac{2x+12}{5}$$

1

$$-\frac{x+2}{3} = -\frac{2x+11}{9}$$

$$\frac{x+2}{3} \times (-1) \times 9 = \frac{2x+11}{9} \times (-1) \times 9$$

$$(x+2) \times (-1) \times 3 = (2x+11) \times (-1) \times 1$$

$$(x+2) \times (-3) = (2x+11) \times (-1)$$

$$-3x - 6 = -2x - 11$$

$$-3x + 2x = -11 + 6$$

$$-x = -5$$

$$-x \div (-1) = -5 \div (-1)$$

$$x = 5$$

2

$$-\frac{-x-6}{2} = -\frac{2x+12}{5}$$

$$\frac{-x-6}{2} \times (-1) \times 10 = \frac{2x+12}{5} \times (-1) \times 10$$

$$(-x-6) \times (-1) \times 5 = (2x+12) \times (-1) \times 2$$

$$(-x-6) \times (-5) = (2x+12) \times (-2)$$

$$5x + 30 = -4x - 24$$

$$5x + 4x = -24 - 30$$

$$9x = -54$$

$$9x \div 9 = -54 \div 9$$

$$x = -6$$

①

$$-\frac{-8x+5}{3} = -\frac{x-58}{3}$$

②

$$-\frac{21}{10}x + \frac{2}{5} = -\frac{3}{2}x - \frac{7}{5}$$

1

$$-\frac{-8x+5}{3} = -\frac{x-58}{3}$$

$$\frac{-8x+5}{3} \times (-1) \times 3 = \frac{x-58}{3} \times (-1) \times 3$$

$$(-8x+5) \times (-1) \times 1 = (x-58) \times (-1) \times 1$$

$$(-8x+5) \times (-1) = (x-58) \times (-1)$$

$$8x-5 = -x+58$$

$$8x+x = 58+5$$

$$9x = 63$$

$$9x \div 9 = 63 \div 9$$

$$x = 7$$

2

$$-\frac{21}{10}x + \frac{2}{5} = -\frac{3}{2}x - \frac{7}{5}$$

$$\left(-\frac{21}{10}x + \frac{2}{5}\right) \times 10 = \left(-\frac{3}{2}x - \frac{7}{5}\right) \times 10$$

$$-\frac{21}{10}x \times 10 + \frac{2}{5} \times 10 = -\frac{3}{2}x \times 10 - \frac{7}{5} \times 10$$

$$-21x \times 1 + 2 \times 2 = -3x \times 5 - 7 \times 2$$

$$-21x + 4 = -15x - 14$$

$$-21x + 15x = -14 - 4$$

$$-6x = -18$$

$$-6x \div (-6) = -18 \div (-6)$$

$$x = 3$$

①

$$-\frac{-x+8}{8} = -\frac{3x+24}{8}$$

②

$$-\frac{x+6}{9} = \frac{-7x+38}{3}$$

1

$$-\frac{-x+8}{8} = -\frac{3x+24}{8}$$

$$\frac{-x+8}{8} \times (-1) \times 8 = \frac{3x+24}{8} \times (-1) \times 8$$

$$(-x+8) \times (-1) \times 1 = (3x+24) \times (-1) \times 1$$

$$(-x+8) \times (-1) = (3x+24) \times (-1)$$

$$x-8 = -3x-24$$

$$x+3x = -24+8$$

$$4x = -16$$

$$4x \div 4 = -16 \div 4$$

$$x = -4$$

2

$$-\frac{x+6}{9} = \frac{-7x+38}{3}$$

$$\frac{x+6}{9} \times (-1) \times 9 = \frac{-7x+38}{3} \times 9$$

$$(x+6) \times (-1) \times 1 = (-7x+38) \times 3$$

$$(x+6) \times (-1) = (-7x+38) \times 3$$

$$-x-6 = -21x+114$$

$$-x+21x = 114+6$$

$$20x = 120$$

$$20x \div 20 = 120 \div 20$$

$$x = 6$$

①

$$\frac{1}{7}x + \frac{1}{7} = \frac{3}{7}x - \frac{9}{7}$$

②

$$\frac{1}{4}x - \frac{1}{4} = -\frac{3}{8}x + \frac{19}{4}$$

1

$$\frac{1}{7}x + \frac{1}{7} = \frac{3}{7}x - \frac{9}{7}$$

$$\left(\frac{1}{7}x + \frac{1}{7}\right) \times 7 = \left(\frac{3}{7}x - \frac{9}{7}\right) \times 7$$

$$\frac{1}{7}x \times 7 + \frac{1}{7} \times 7 = \frac{3}{7}x \times 7 - \frac{9}{7} \times 7$$

$$x \times 1 + 1 \times 1 = 3x \times 1 - 9 \times 1$$

$$x + 1 = 3x - 9$$

$$x - 3x = -9 - 1$$

$$-2x = -10$$

$$-2x \div (-2) = -10 \div (-2)$$

$$x = 5$$

2

$$\frac{1}{4}x - \frac{1}{4} = -\frac{3}{8}x + \frac{19}{4}$$

$$\left(\frac{1}{4}x - \frac{1}{4}\right) \times 8 = \left(-\frac{3}{8}x + \frac{19}{4}\right) \times 8$$

$$\frac{1}{4}x \times 8 - \frac{1}{4} \times 8 = -\frac{3}{8}x \times 8 + \frac{19}{4} \times 8$$

$$x \times 2 - 1 \times 2 = -3x \times 1 + 19 \times 2$$

$$2x - 2 = -3x + 38$$

$$2x + 3x = 38 + 2$$

$$5x = 40$$

$$5x \div 5 = 40 \div 5$$

$$x = 8$$

1

$$-\frac{8x+7}{9} = \frac{3x-38}{6}$$

2

$$\frac{23}{8}x + \frac{3}{8} = \frac{5}{2}x - \frac{21}{8}$$

1

$$-\frac{8x+7}{9} = \frac{3x-38}{6}$$

$$\frac{8x+7}{9} \times (-1) \times 18 = \frac{3x-38}{6} \times 18$$

$$(8x+7) \times (-1) \times 2 = (3x-38) \times 3$$

$$(8x+7) \times (-2) = (3x-38) \times 3$$

$$-16x - 14 = 9x - 114$$

$$-16x - 9x = -114 + 14$$

$$-25x = -100$$

$$-25x \div (-25) = -100 \div (-25)$$

$$x = 4$$

2

$$\frac{23}{8}x + \frac{3}{8} = \frac{5}{2}x - \frac{21}{8}$$

$$\left(\frac{23}{8}x + \frac{3}{8}\right) \times 8 = \left(\frac{5}{2}x - \frac{21}{8}\right) \times 8$$

$$\frac{23}{8}x \times 8 + \frac{3}{8} \times 8 = \frac{5}{2}x \times 8 - \frac{21}{8} \times 8$$

$$23x \times 1 + 3 \times 1 = 5x \times 4 - 21 \times 1$$

$$23x + 3 = 20x - 21$$

$$23x - 20x = -21 - 3$$

$$3x = -24$$

$$3x \div 3 = -24 \div 3$$

$$x = -8$$

①

$$-\frac{17}{28}x - \frac{3}{2} = -\frac{3}{4}x - \frac{3}{14}$$

②

$$-\frac{4x-5}{5} = \frac{2x+11}{2}$$

1

$$\begin{aligned} -\frac{17}{28}x - \frac{3}{2} &= -\frac{3}{4}x - \frac{3}{14} \\ \left(-\frac{17}{28}x - \frac{3}{2}\right) \times 28 &= \left(-\frac{3}{4}x - \frac{3}{14}\right) \times 28 \\ -\frac{17}{28}x \times 28 - \frac{3}{2} \times 28 &= -\frac{3}{4}x \times 28 - \frac{3}{14} \times 28 \\ -17x \times 1 - 3 \times 14 &= -3x \times 7 - 3 \times 2 \\ -17x - 42 &= -21x - 6 \\ -17x + 21x &= -6 + 42 \\ 4x &= 36 \\ 4x \div 4 &= 36 \div 4 \\ x &= 9 \end{aligned}$$

2

$$\begin{aligned} -\frac{4x-5}{5} &= \frac{2x+11}{2} \\ \frac{4x-5}{5} \times (-1) \times 10 &= \frac{2x+11}{2} \times 10 \\ (4x-5) \times (-1) \times 2 &= (2x+11) \times 5 \\ (4x-5) \times (-2) &= (2x+11) \times 5 \\ -8x+10 &= 10x+55 \\ -8x-10x &= 55-10 \\ -18x &= 45 \\ -18x \div (-18) &= 45 \div (-18) \\ x &= -\frac{5}{2} \end{aligned}$$

①

$$\frac{7x - 8}{2} = \frac{x - 14}{6}$$

②

$$\frac{9}{7}x - \frac{3}{7} = \frac{5}{7}x - \frac{15}{7}$$

1

$$\begin{aligned}\frac{7x-8}{2} &= \frac{x-14}{6} \\ \frac{7x-8}{2} \times 6 &= \frac{x-14}{6} \times 6 \\ (7x-8) \times 3 &= (x-14) \times 1 \\ 21x-24 &= x-14 \\ 21x-x &= -14+24 \\ 20x &= 10 \\ 20x \div 20 &= 10 \div 20 \\ x &= \frac{1}{2}\end{aligned}$$

2

$$\begin{aligned}\frac{9}{7}x - \frac{3}{7} &= \frac{5}{7}x - \frac{15}{7} \\ \left(\frac{9}{7}x - \frac{3}{7}\right) \times 7 &= \left(\frac{5}{7}x - \frac{15}{7}\right) \times 7 \\ \frac{9}{7}x \times 7 - \frac{3}{7} \times 7 &= \frac{5}{7}x \times 7 - \frac{15}{7} \times 7 \\ 9x \times 1 - 3 \times 1 &= 5x \times 1 - 15 \times 1 \\ 9x - 3 &= 5x - 15 \\ 9x - 5x &= -15 + 3 \\ 4x &= -12 \\ 4x \div 4 &= -12 \div 4 \\ x &= -3\end{aligned}$$