

すきプリ 中学数学

連立方程式の問題【かっこ】

もくじ

連立方程式の問題【かっこ1】

連立方程式の問題【かっこ2】

連立方程式の問題【かっこまとめ】

問題

かっこを含む連立方程式を解いてみましょう。

$$\begin{cases} -9(x - 2y) - 14y = -6 \\ 2x - y = 2 \end{cases}$$

$$\begin{cases} -4x + y = 9 \\ 3(x + 2y) - 7y = -3 \end{cases}$$

$$\begin{cases} -9(x-2y) - 14y = -6 & \dots\dots\textcircled{1} \\ 2x - y = 2 & \dots\dots\textcircled{2} \end{cases} \quad \begin{cases} -4x + y = 9 & \dots\dots\textcircled{1} \\ 3(x+2y) - 7y = -3 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -9(x-2y) - 14y &= -6 \\ -9x + 18y - 14y &= -6 \\ -9x + 4y &= -6 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\begin{array}{r} \textcircled{3} \quad -9x + 4y = -6 \\ \textcircled{2} \times 4 \quad +) \quad 8x - 4y = 8 \\ \hline \quad -x \quad = 2 \\ \quad \quad \quad x = -2 \end{array}$$

$x = -2$ を②に代入すると

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

答え $x = -2, y = -6$

②のかっこをはずすと

$$\begin{aligned} 3(x+2y) - 7y &= -3 \\ 3x + 6y - 7y &= -3 \\ 3x - y &= -3 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\begin{array}{r} \textcircled{1} \quad -4x + y = 9 \\ \textcircled{3} \quad +) \quad 3x - y = -3 \\ \hline \quad -x \quad = 6 \\ \quad \quad \quad x = -6 \end{array}$$

$x = -6$ を③に代入すると

$$\begin{aligned} 3x - y &= -3 \\ 3 \times (-6) - y &= -3 \\ -18 - y &= -3 \\ -y &= 15 \\ y &= -15 \end{aligned}$$

答え $x = -6, y = -15$

$$\begin{cases} -2x - y = 15 \\ 2(2x - 2y) + 7y = -17 \end{cases}$$

$$\begin{cases} -2(x + 2y) + 3y = -1 \\ 3x + 4y = -11 \end{cases}$$

$$\begin{cases} -2x - y = 15 & \dots\dots ① \\ 2(2x - 2y) + 7y = -17 & \dots\dots ② \end{cases} \quad \begin{cases} -2(x + 2y) + 3y = -1 & \dots\dots ① \\ 3x + 4y = -11 & \dots\dots ② \end{cases}$$

②のかっこをはずすと

$$\begin{aligned} 2(2x - 2y) + 7y &= -17 \\ 4x - 4y + 7y &= -17 \\ 4x + 3y &= -17 \quad \dots\dots ③ \end{aligned}$$

$$① \times 2 \quad -4x - 2y = 30$$

$$③ \quad \begin{array}{r} +) \quad 4x + 3y = -17 \\ \hline y = 13 \end{array}$$

$$y = 13$$

$y = 13$ を①に代入すると

$$\begin{aligned} -2x - y &= 15 \\ -2x - 1 \times 13 &= 15 \\ -2x - 13 &= 15 \\ -2x &= 28 \\ x &= -14 \end{aligned}$$

答え $x = -14, y = 13$

①のかっこをはずすと

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

$$③ \times 3 \quad -6x - 3y = -3$$

$$② \times 2 \quad \begin{array}{r} +) \quad 6x + 8y = -22 \\ \hline 5y = -25 \end{array}$$

$$y = -5$$

$y = -5$ を③に代入すると

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

答え $x = 3, y = -5$

$$\begin{cases} -2x - y = -2 \\ -2(x - 3y) - 5y = -14 \end{cases}$$

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

$$\begin{cases} -2x - y = -2 & \dots\dots\textcircled{1} \\ -2(x - 3y) - 5y = -14 & \dots\dots\textcircled{2} \end{cases} \quad \begin{cases} -2(4x + 6y) + 3y = 1 & \dots\dots\textcircled{1} \\ -5x - 3y = -2 & \dots\dots\textcircled{2} \end{cases}$$

②のかっこをはずすと

$$\begin{aligned} -2(x - 3y) - 5y &= -14 \\ -2x + 6y - 5y &= -14 \\ -2x + y &= -14 \quad \dots\dots\textcircled{3} \end{aligned}$$

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

$$\begin{array}{r} \textcircled{3} \quad -) -2x + y = -14 \\ \underline{-2x = 12} \\ y = -6 \end{array}$$

$y = -6$ を①に代入すると

$$\begin{aligned} -2x - y &= -2 \\ -2x - 1 \times (-6) &= -2 \\ -2x + 6 &= -2 \\ -2x &= -8 \\ x &= 4 \end{aligned}$$

答え $x = 4, y = -6$

①のかっこをはずすと

$$\begin{aligned} -2(4x + 6y) + 3y &= 1 \\ -8x - 12y + 3y &= 1 \\ -8x - 9y &= 1 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{3} \quad -8x - 9y = 1$$

$$\begin{array}{r} \textcircled{2} \times 3 \quad -) -15x - 9y = -6 \\ \underline{7x = 7} \\ x = 1 \end{array}$$

$x = 1$ を②に代入すると

$$\begin{aligned} -5x - 3y &= -2 \\ -5 \times 1 - 3y &= -2 \\ -5 - 3y &= -2 \\ -3y &= 3 \\ y &= -1 \end{aligned}$$

答え $x = 1, y = -1$

$$\begin{cases} 4(-2x + 14) + 9y = 94 \\ -2x + 3y = 8 \end{cases}$$

$$\begin{cases} x + 2y = 0 \\ 3(x + 3y) - 8y = 15 \end{cases}$$

$$\begin{cases} 4(-2x + 14) + 9y = 94 & \dots\dots ① \\ -2x + 3y = 8 & \dots\dots ② \end{cases} \quad \begin{cases} x + 2y = 0 & \dots\dots ① \\ 3(x + 3y) - 8y = 15 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} 4(-2x + 14) + 9y &= 94 \\ -8x + 56 + 9y &= 94 \\ -8x + 9y &= 38 & \dots\dots ③ \end{aligned}$$

$$③ \quad -8x + 9y = 38$$

$$② \times 3 \quad \begin{array}{r} -) -6x + 9y = 24 \\ \underline{-2x} \quad \quad = 14 \end{array}$$

$$x = -7$$

$x = -7$ を②に代入すると

$$\begin{aligned} -2x + 3y &= 8 \\ -2 \times (-7) + 3y &= 8 \\ 14 + 3y &= 8 \\ 3y &= -6 \\ y &= -2 \end{aligned}$$

答え $x = -7, y = -2$

②のかっこをはずすと

$$\begin{aligned} 3(x + 3y) - 8y &= 15 \\ 3x + 9y - 8y &= 15 \\ 3x + y &= 15 & \dots\dots ③ \end{aligned}$$

$$① \quad x + 2y = 0$$

$$③ \times 2 \quad \begin{array}{r} -) 6x + 2y = 30 \\ \underline{-5x} \quad \quad = -30 \end{array}$$

$$x = 6$$

$x = 6$ を①に代入すると

$$\begin{aligned} x + 2y &= 0 \\ 1 \times 6 + 2y &= 0 \\ 6 + 2y &= 0 \\ 2y &= -6 \\ y &= -3 \end{aligned}$$

答え $x = 6, y = -3$

$$\begin{cases} -2x - y = 3 \\ 26x + 9(-2x + y) = -17 \end{cases}$$

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

$$\begin{cases} -2x - y = 3 & \dots\dots\textcircled{1} \\ 26x + 9(-2x + y) = -17 & \dots\dots\textcircled{2} \end{cases} \quad \begin{cases} 7x + 3(-2x + y) = -13 & \dots\dots\textcircled{1} \\ x + 2y = -8 & \dots\dots\textcircled{2} \end{cases}$$

②のかっこをはずすと

$$\begin{aligned} 26x + 9(-2x + y) &= -17 \\ 26x - 18x + 9y &= -17 \\ 8x + 9y &= -17 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{1} \times 4 \quad -8x - 4y = 12$$

$$\textcircled{3} \quad \begin{array}{r} +) 8x + 9y = -17 \\ \hline 5y = -5 \end{array}$$

$$y = -1$$

$y = -1$ を①に代入すると

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

答え $x = -1, y = -1$

①のかっこをはずすと

$$\begin{aligned} 7x + 3(-2x + y) &= -13 \\ 7x - 6x + 3y &= -13 \\ x + 3y &= -13 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{3} \quad x + 3y = -13$$

$$\textcircled{2} \quad \begin{array}{r} -) x + 2y = -8 \\ \hline y = -5 \end{array}$$

$$y = -5$$

$y = -5$ を②に代入すると

$$\begin{aligned} x + 2y &= -8 \\ x + 2 \times (-5) &= -8 \\ x - 10 &= -8 \\ x &= 2 \end{aligned}$$

答え $x = 2, y = -5$

$$\begin{cases} -3(x + 2y) + 5y = -19 \\ -2x + y = -16 \end{cases}$$

$$\begin{cases} -6x + y = -32 \\ 3(x + 2y) - 7y = 20 \end{cases}$$

$$\begin{cases} -3(x+2y)+5y=-19 & \dots\dots\textcircled{1} \\ -2x+y=-16 & \dots\dots\textcircled{2} \end{cases} \quad \begin{cases} -6x+y=-32 & \dots\dots\textcircled{1} \\ 3(x+2y)-7y=20 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -3(x+2y)+5y &= -19 \\ -3x-6y+5y &= -19 \\ -3x-y &= -19 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{3} \quad -3x-y=-19$$

$$\textcircled{2} \quad \begin{array}{r} +) -2x+y=-16 \\ \hline -5x \quad = -35 \end{array}$$

$$x=7$$

$x=7$ を②に代入すると

$$\begin{aligned} -2x+y &= -16 \\ -2 \times 7 + y &= -16 \\ -14 + y &= -16 \\ y &= -2 \end{aligned}$$

答え $x=7, y=-2$

②のかっこをはずすと

$$\begin{aligned} 3(x+2y)-7y &= 20 \\ 3x+6y-7y &= 20 \\ 3x-y &= 20 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{1} \quad -6x+y=-32$$

$$\textcircled{3} \quad \begin{array}{r} +) 3x-y=20 \\ \hline -3x \quad = -12 \end{array}$$

$$x=4$$

$x=4$ を③に代入すると

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

答え $x=4, y=-8$

$$\begin{cases} -3x + 2y = -6 \\ 3(x + 3y) - 8y = 15 \end{cases}$$

$$\begin{cases} -13x + 3(3x + y) = 43 \\ -2x + 3y = 17 \end{cases}$$

$$\begin{cases} -3x + 2y = -6 & \dots\dots ① \\ 3(x + 3y) - 8y = 15 & \dots\dots ② \end{cases}$$

②のかっこをはずすと

$$\begin{aligned} 3(x + 3y) - 8y &= 15 \\ 3x + 9y - 8y &= 15 \\ 3x + y &= 15 \quad \dots\dots ③ \end{aligned}$$

$$① \quad -3x + 2y = -6$$

$$③ \quad \begin{array}{r} +) \quad 3x + y = 15 \\ \hline \quad \quad 3y = 9 \end{array}$$

$$y = 3$$

$y = 3$ を①に代入すると

$$\begin{aligned} -3x + 2y &= -6 \\ -3x + 2 \times 3 &= -6 \\ -3x + 6 &= -6 \\ -3x &= -12 \\ x &= 4 \end{aligned}$$

答え $x = 4, y = 3$

$$\begin{cases} -13x + 3(3x + y) = 43 & \dots\dots ① \\ -2x + 3y = 17 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -13x + 3(3x + y) &= 43 \\ -13x + 9x + 3y &= 43 \\ -4x + 3y &= 43 \quad \dots\dots ③ \end{aligned}$$

$$③ \quad -4x + 3y = 43$$

$$② \quad \begin{array}{r} -) \quad -2x + 3y = 17 \\ \hline \quad \quad -2x = 26 \end{array}$$

$$x = -13$$

$x = -13$ を②に代入すると

$$\begin{aligned} -2x + 3y &= 17 \\ -2 \times (-13) + 3y &= 17 \\ 26 + 3y &= 17 \\ 3y &= -9 \\ y &= -3 \end{aligned}$$

答え $x = -13, y = -3$

$$\begin{cases} -2(x + 2y) + 3y = 9 \\ -x - 3y = 22 \end{cases}$$

$$\begin{cases} 2x - y = 12 \\ 2(x - 2y) + 7y = -12 \end{cases}$$

$$\begin{cases} -2(x+2y)+3y=9 & \dots\dots\textcircled{1} \\ -x-3y=22 & \dots\dots\textcircled{2} \end{cases}$$

$$\begin{cases} 2x-y=12 & \dots\dots\textcircled{1} \\ 2(x-2y)+7y=-12 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

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

$$\textcircled{3} \quad -2x-y=9$$

$$\textcircled{2} \times 2 \quad \begin{array}{r} -) -2x-6y=44 \\ \hline 5y=-35 \end{array}$$

$$y=-7$$

$y=-7$ を③に代入すると

$$\begin{aligned} -2x-y &= 9 \\ -2x-1 \times (-7) &= 9 \\ -2x+7 &= 9 \\ -2x &= 2 \\ x &= -1 \end{aligned}$$

答え $x=-1, y=-7$

②のかっこをはずすと

$$\begin{aligned} 2(x-2y)+7y &= -12 \\ 2x-4y+7y &= -12 \\ 2x+3y &= -12 & \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{1} \quad 2x-y=12$$

$$\textcircled{3} \quad \begin{array}{r} -) 2x+3y=-12 \\ \hline -4y=24 \end{array}$$

$$y=-6$$

$y=-6$ を①に代入すると

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

答え $x=3, y=-6$

$$\begin{cases} 2x + 3y = 9 \\ 3(x + 3y) - 8y = 10 \end{cases}$$

$$\begin{cases} 3x - 2(2x + y) = -5 \\ 2x + 3y = 13 \end{cases}$$

$$\begin{cases} 2x + 3y = 9 & \dots\dots ① \\ 3(x + 3y) - 8y = 10 & \dots\dots ② \end{cases}$$

②のかっこをはずすと

$$\begin{aligned} 3(x + 3y) - 8y &= 10 \\ 3x + 9y - 8y &= 10 \\ 3x + y &= 10 \quad \dots\dots ③ \end{aligned}$$

$$① \quad 2x + 3y = 9$$

$$③ \times 3 \quad -) \quad \begin{array}{r} 9x + 3y = 30 \\ -7x \quad \quad = -21 \end{array}$$

$$x = 3$$

$x = 3$ を①に代入すると

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

答え $x = 3, y = 1$

$$\begin{cases} 3x - 2(2x + y) = -5 & \dots\dots ① \\ 2x + 3y = 13 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} 3x - 2(2x + y) &= -5 \\ 3x - 4x - 2y &= -5 \\ -x - 2y &= -5 \quad \dots\dots ③ \end{aligned}$$

$$③ \times 2 \quad -2x - 4y = -10$$

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

$$y = -3$$

$y = -3$ を③に代入すると

$$\begin{aligned} -x - 2y &= -5 \\ -x - 2 \times (-3) &= -5 \\ -x + 6 &= -5 \\ -x &= -11 \\ x &= 11 \end{aligned}$$

答え $x = 11, y = -3$

$$\begin{cases} -3x + 4y = 10 \\ 7x - 2(3x + y) = -6 \end{cases}$$

$$\begin{cases} 5x + 2(-3x + y) = 12 \\ -2x + 3y = 13 \end{cases}$$

$$\begin{cases} -3x + 4y = 10 & \dots\dots\textcircled{1} \\ 7x - 2(3x + y) = -6 & \dots\dots\textcircled{2} \end{cases}$$

②のかっこをはずすと

$$\begin{aligned} 7x - 2(3x + y) &= -6 \\ 7x - 6x - 2y &= -6 \\ x - 2y &= -6 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{1} \quad -3x + 4y = 10$$

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

$x = 2$ を③に代入すると

$$\begin{aligned} x - 2y &= -6 \\ 1 \times 2 - 2y &= -6 \\ 2 - 2y &= -6 \\ -2y &= -8 \\ y &= 4 \end{aligned}$$

答え $x = 2, y = 4$

$$\begin{cases} 5x + 2(-3x + y) = 12 & \dots\dots\textcircled{1} \\ -2x + 3y = 13 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} 5x + 2(-3x + y) &= 12 \\ 5x - 6x + 2y &= 12 \\ -x + 2y &= 12 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{3} \times 2 \quad -2x + 4y = 24$$

$$\begin{array}{r} \textcircled{2} \quad -) \quad -2x + 3y = 13 \\ \quad \quad \quad y = 11 \\ \hline \quad \quad \quad y = 11 \end{array}$$

$y = 11$ を③に代入すると

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

答え $x = 10, y = 11$

$$\begin{cases} -2(x + 2y) + 3y = -12 \\ 2x + 3y = -12 \end{cases}$$

$$\begin{cases} -4(x + 3y) + 9y = -1 \\ -3x - 2y = 0 \end{cases}$$

$$\begin{cases} -2(x+2y)+3y=-12 & \dots\dots\textcircled{1} \\ 2x+3y=-12 & \dots\dots\textcircled{2} \end{cases} \quad \begin{cases} -4(x+3y)+9y=-1 & \dots\dots\textcircled{1} \\ -3x-2y=0 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -2(x+2y)+3y &= -12 \\ -2x-4y+3y &= -12 \\ -2x-y &= -12 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{3} \quad -2x - y = -12$$

$$\textcircled{2} \quad \begin{array}{r} +) \quad 2x+3y=-12 \\ \hline \quad 2y=-24 \end{array}$$

$$y = -12$$

$y = -12$ を③に代入すると

$$\begin{aligned} -2x - y &= -12 \\ -2x - 1 \times (-12) &= -12 \\ -2x + 12 &= -12 \\ -2x &= -24 \\ x &= 12 \end{aligned}$$

答え $x = 12, y = -12$

①のかっこをはずすと

$$\begin{aligned} -4(x+3y)+9y &= -1 \\ -4x-12y+9y &= -1 \\ -4x-3y &= -1 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{3} \times 2 \quad -8x - 6y = -2$$

$$\textcircled{2} \times 3 \quad \begin{array}{r} -) \quad -9x-6y=0 \\ \hline \quad x=-2 \end{array}$$

$$x = -2$$

$x = -2$ を②に代入すると

$$\begin{aligned} -3x - 2y &= 0 \\ -3 \times (-2) - 2y &= 0 \\ 6 - 2y &= 0 \\ -2y &= -6 \\ y &= 3 \end{aligned}$$

答え $x = -2, y = 3$

$$\begin{cases} 7x + 2(-3x + y) = 9 \\ x + 3y = 14 \end{cases}$$

$$\begin{cases} -3x - 2y = -34 \\ -3(x + 2y) + 5y = -20 \end{cases}$$

$$\begin{cases} 7x + 2(-3x + y) = 9 & \dots\dots\textcircled{1} \\ x + 3y = 14 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} 7x + 2(-3x + y) &= 9 \\ 7x - 6x + 2y &= 9 \\ x + 2y &= 9 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{3} \quad x + 2y = 9$$

$$\textcircled{2} \quad \begin{array}{r} -) x + 3y = 14 \\ \underline{ - y = -5} \end{array}$$

$$y = 5$$

$y = 5$ を③に代入すると

$$x + 2y = 9$$

$$x + 2 \times 5 = 9$$

$$x + 10 = 9$$

$$x = -1$$

答え $x = -1, y = 5$

$$\begin{cases} -3x - 2y = -34 & \dots\dots\textcircled{1} \\ -3(x + 2y) + 5y = -20 & \dots\dots\textcircled{2} \end{cases}$$

②のかっこをはずすと

$$\begin{aligned} -3(x + 2y) + 5y &= -20 \\ -3x - 6y + 5y &= -20 \\ -3x - y &= -20 \quad \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{1} \quad -3x - 2y = -34$$

$$\textcircled{3} \quad \begin{array}{r} -) -3x - y = -20 \\ \underline{ -y = -14} \end{array}$$

$$y = 14$$

$y = 14$ を③に代入すると

$$-3x - y = -20$$

$$-3x - 1 \times 14 = -20$$

$$-3x - 14 = -20$$

$$-3x = -6$$

$$x = 2$$

答え $x = 2, y = 14$

$$\begin{cases} -x + 3(2x + y) = -12 \\ 3x + 2y = -6 \end{cases}$$

$$\begin{cases} 7x + 3(-2x + y) = -1 \\ 4x - 9y = -25 \end{cases}$$

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

$$\begin{cases} 7x + 3(-2x + y) = -1 & \dots\dots ① \\ 4x - 9y = -25 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -x + 3(2x + y) &= -12 \\ -x + 6x + 3y &= -12 \\ 5x + 3y &= -12 \quad \dots\dots ③ \end{aligned}$$

$$\begin{array}{r} ③ \times 2 \quad 10x + 6y = -24 \\ ② \times 3 \quad -) \quad 9x + 6y = -18 \\ \hline x = -6 \end{array}$$

$x = -6$ を②に代入すると

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

答え $x = -6, y = 6$

①のかっこをはずすと

$$\begin{aligned} 7x + 3(-2x + y) &= -1 \\ 7x - 6x + 3y &= -1 \\ x + 3y &= -1 \quad \dots\dots ③ \end{aligned}$$

$$\begin{array}{r} ③ \times 3 \quad 3x + 9y = -3 \\ ② \quad +) \quad 4x - 9y = -25 \\ \hline 7x = -28 \\ x = -4 \end{array}$$

$x = -4$ を③に代入すると

$$\begin{aligned} x + 3y &= -1 \\ 1 \times (-4) + 3y &= -1 \\ -4 + 3y &= -1 \\ 3y &= 3 \\ y &= 1 \end{aligned}$$

答え $x = -4, y = 1$

$$\begin{cases} 5x - 3(2x + y) = -1 \\ 5x + 3y = 41 \end{cases}$$

$$\begin{cases} -3(x - 3y) - 7y = 0 \\ -2x + 3y = -5 \end{cases}$$

$$\begin{cases} 5x - 3(2x + y) = -1 & \dots\dots\textcircled{1} \\ 5x + 3y = 41 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

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

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

$$\textcircled{2} \quad \begin{array}{r} +) 5x + 3y = 41 \\ \hline 4x \qquad = 40 \end{array}$$

$$x = 10$$

$x = 10$ を③に代入すると

$$\begin{aligned} -x - 3y &= -1 \\ -1 \times 10 - 3y &= -1 \\ -10 - 3y &= -1 \\ -3y &= 9 \\ y &= -3 \end{aligned}$$

答え $x = 10, y = -3$

$$\begin{cases} -3(x - 3y) - 7y = 0 & \dots\dots\textcircled{1} \\ -2x + 3y = -5 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -3(x - 3y) - 7y &= 0 \\ -3x + 9y - 7y &= 0 \\ -3x + 2y &= 0 & \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{3} \times 2 \quad -6x + 4y = 0$$

$$\textcircled{2} \times 3 \quad \begin{array}{r} -) -6x + 9y = -15 \\ \hline -5y = 15 \end{array}$$

$$y = -3$$

$y = -3$ を③に代入すると

$$\begin{aligned} -3x + 2y &= 0 \\ -3x + 2 \times (-3) &= 0 \\ -3x - 6 &= 0 \\ -3x &= 6 \\ x &= -2 \end{aligned}$$

答え $x = -2, y = -3$

問題

かっこを含む連立方程式を解いてみましょう。

$$\begin{cases} -13x + 3(3x + y) = -13 \\ -11x - 3(-3x + y) = 7 \end{cases}$$

$$\begin{cases} -2(4x + 2y) + 11y = -2 \\ 3(x - 2y) + 4y = 2 \end{cases}$$

$$\begin{cases} -13x + 3(3x + y) = -13 & \dots\dots ① \\ -11x - 3(-3x + y) = 7 & \dots\dots ② \end{cases} \quad \begin{cases} -2(4x + 2y) + 11y = -2 & \dots\dots ① \\ 3(x - 2y) + 4y = 2 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -13x + 3(3x + y) &= -13 \\ -13x + 9x + 3y &= -13 \\ -4x + 3y &= -13 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} -11x - 3(-3x + y) &= 7 \\ -11x + 9x - 3y &= 7 \\ -2x - 3y &= 7 & \dots\dots ④ \end{aligned}$$

$$③ \quad -4x + 3y = -13$$

$$④ \quad \begin{array}{r} +) -2x - 3y = 7 \\ \hline -6x \qquad = -6 \end{array}$$

$$x = 1$$

$x = 1$ を④に代入すると

$$\begin{aligned} -2x - 3y &= 7 \\ -2 \times 1 - 3y &= 7 \\ -2 - 3y &= 7 \\ -3y &= 9 \\ y &= -3 \end{aligned}$$

答え $x = 1, y = -3$

①のかっこをはずすと

$$\begin{aligned} -2(4x + 2y) + 11y &= -2 \\ -8x - 4y + 11y &= -2 \\ -8x + 7y &= -2 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

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

$$③ \times 2 \quad -16x + 14y = -4$$

$$④ \times 7 \quad \begin{array}{r} +) 21x - 14y = 14 \\ \hline 5x \qquad = 10 \end{array}$$

$$x = 2$$

$x = 2$ を④に代入すると

$$\begin{aligned} 3x - 2y &= 2 \\ 3 \times 2 - 2y &= 2 \\ 6 - 2y &= 2 \\ -2y &= -4 \\ y &= 2 \end{aligned}$$

答え $x = 2, y = 2$

$$\begin{cases} 6x + 5(-2x + y) = -32 \\ 2(x + 4y) - 13y = 6 \end{cases}$$

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

$$\begin{cases} 6x + 5(-2x + y) = -32 & \dots\dots ① \\ 2(x + 4y) - 13y = 6 & \dots\dots ② \end{cases} \quad \begin{cases} -3(x + 4y) + 8y = -14 & \dots\dots ① \\ 2(x + 3y) - 7y = 2 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} 6x + 5(-2x + y) &= -32 \\ 6x - 10x + 5y &= -32 \\ -4x + 5y &= -32 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 2(x + 4y) - 13y &= 6 \\ 2x + 8y - 13y &= 6 \\ 2x - 5y &= 6 & \dots\dots ④ \end{aligned}$$

$$③ \quad -4x + 5y = -32$$

$$④ \quad \begin{array}{r} +) \quad 2x - 5y = \quad 6 \\ \hline -2x \quad \quad = -26 \end{array}$$

$$x = 13$$

$x = 13$ を④に代入すると

$$\begin{aligned} 2x - 5y &= 6 \\ 2 \times 13 - 5y &= 6 \\ 26 - 5y &= 6 \\ -5y &= -20 \\ y &= 4 \end{aligned}$$

答え $x = 13, y = 4$

①のかっこをはずすと

$$\begin{aligned} -3(x + 4y) + 8y &= -14 \\ -3x - 12y + 8y &= -14 \\ -3x - 4y &= -14 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 2(x + 3y) - 7y &= 2 \\ 2x + 6y - 7y &= 2 \\ 2x - y &= 2 & \dots\dots ④ \end{aligned}$$

$$③ \times 2 \quad -6x - 8y = -28$$

$$④ \times 3 \quad \begin{array}{r} +) \quad 6x - 3y = \quad 6 \\ \hline -11y = -22 \end{array}$$

$$y = 2$$

$y = 2$ を④に代入すると

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

答え $x = 2, y = 2$

$$\begin{cases} -3(x - 3y) - 8y = 22 \\ -2(x + 2y) + 3y = 13 \end{cases}$$

$$\begin{cases} -3(x + 4y) + 8y = 33 \\ x + 2(2y + 3) = 3 \end{cases}$$

$$\begin{cases} -3(x-3y)-8y=22 & \dots\dots ① \\ -2(x+2y)+3y=13 & \dots\dots ② \end{cases}$$

$$\begin{cases} -3(x+4y)+8y=33 & \dots\dots ① \\ x+2(2y+3)=3 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -3(x-3y)-8y &= 22 \\ -3x+9y-8y &= 22 \\ -3x+y &= 22 & \dots\dots ③ \end{aligned}$$

①のかっこをはずすと

$$\begin{aligned} -3(x+4y)+8y &= 33 \\ -3x-12y+8y &= 33 \\ -3x-4y &= 33 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

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

②のかっこをはずすと

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

③ $-3x+y=22$

③ $-3x-4y=33$

④ $\begin{array}{r} +) -2x - y = 13 \\ \hline -5x \quad = 35 \end{array}$

④ $\begin{array}{r} +) \quad x + 4y = -3 \\ \hline -2x \quad = 30 \end{array}$

$$x = -7$$

$$x = -15$$

$x = -7$ を④に代入すると

$x = -15$ を④に代入すると

$$\begin{aligned} -2x - y &= 13 \\ -2 \times (-7) - y &= 13 \\ 14 - y &= 13 \\ -y &= -1 \\ y &= 1 \end{aligned}$$

$$\begin{aligned} x + 4y &= -3 \\ 1 \times (-15) + 4y &= -3 \\ -15 + 4y &= -3 \\ 4y &= 12 \\ y &= 3 \end{aligned}$$

答え $x = -7, y = 1$

答え $x = -15, y = 3$

$$\begin{cases} -13x + 3(3x + y) = -1 \\ 8(x + 3y) - 31y = 5 \end{cases}$$

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

$$\begin{cases} -13x + 3(3x + y) = -1 & \dots\dots ① \\ 8(x + 3y) - 31y = 5 & \dots\dots ② \end{cases} \quad \begin{cases} 3x - 2(2x + y) = 4 & \dots\dots ① \\ 2(x + 5y) - 5y = -6 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -13x + 3(3x + y) &= -1 \\ -13x + 9x + 3y &= -1 \\ -4x + 3y &= -1 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 8(x + 3y) - 31y &= 5 \\ 8x + 24y - 31y &= 5 \\ 8x - 7y &= 5 & \dots\dots ④ \end{aligned}$$

$$③ \times 2 \quad -8x + 6y = -2$$

$$\begin{array}{r} ④ \quad +) \quad 8x - 7y = 5 \\ \hline \quad \quad -y = 3 \\ \quad \quad \quad y = -3 \end{array}$$

$y = -3$ を④に代入すると

$$\begin{aligned} -4x + 3y &= -1 \\ -4x + 3 \times (-3) &= -1 \\ -4x - 9 &= -1 \\ -4x &= 8 \\ x &= -2 \end{aligned}$$

答え $x = -2, y = -3$

①のかっこをはずすと

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

②のかっこをはずすと

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

$$③ \times 2 \quad -2x - 4y = 8$$

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

$y = 2$ を④に代入すると

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

答え $x = -8, y = 2$

$$\begin{cases} -3(3x - 2y) - 7y = 13 \\ -3(x + 2y) + 5y = 1 \end{cases}$$

$$\begin{cases} 5x + 2(-2x + 2y) = 40 \\ 7x + 2(-3x + y) = 18 \end{cases}$$

$$\begin{cases} -3(3x - 2y) - 7y = 13 & \dots\dots ① \\ -3(x + 2y) + 5y = 1 & \dots\dots ② \end{cases} \quad \begin{cases} 5x + 2(-2x + 2y) = 40 & \dots\dots ① \\ 7x + 2(-3x + y) = 18 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -3(3x - 2y) - 7y &= 13 \\ -9x + 6y - 7y &= 13 \\ -9x - y &= 13 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

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

$$③ \quad -9x - y = 13$$

$$④ \quad \begin{array}{r} -) -3x - y = 1 \\ \underline{-6x} \quad = 12 \end{array}$$

$$x = -2$$

$x = -2$ を④に代入すると

$$\begin{aligned} -3x - y &= 1 \\ -3 \times (-2) - y &= 1 \\ 6 - y &= 1 \\ -y &= -5 \\ y &= 5 \end{aligned}$$

答え $x = -2, y = 5$

①のかっこをはずすと

$$\begin{aligned} 5x + 2(-2x + 2y) &= 40 \\ 5x - 4x + 4y &= 40 \\ x + 4y &= 40 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 7x + 2(-3x + y) &= 18 \\ 7x - 6x + 2y &= 18 \\ x + 2y &= 18 & \dots\dots ④ \end{aligned}$$

$$③ \quad x + 4y = 40$$

$$④ \quad \begin{array}{r} -) x + 2y = 18 \\ \underline{2y} = 22 \end{array}$$

$$y = 11$$

$y = 11$ を④に代入すると

$$\begin{aligned} x + 2y &= 18 \\ x + 2 \times 11 &= 18 \\ x + 22 &= 18 \\ x &= -4 \end{aligned}$$

答え $x = -4, y = 11$

$$\begin{cases} 3x - 2(2x + y) = -3 \\ 7x - 2(3x + y) = -29 \end{cases}$$

$$\begin{cases} -3(x - 3y) - 7y = 15 \\ -2(x - 3y) - 5y = 11 \end{cases}$$

$$\begin{cases} 3x - 2(2x + y) = -3 & \dots\dots ① \\ 7x - 2(3x + y) = -29 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

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

②のかっこをはずすと

$$\begin{aligned} 7x - 2(3x + y) &= -29 \\ 7x - 6x - 2y &= -29 \\ x - 2y &= -29 & \dots\dots ④ \end{aligned}$$

$$③ \quad -x - 2y = -3$$

$$④ \quad \begin{array}{r} +) \quad x - 2y = -29 \\ \hline -4y = -32 \end{array}$$

$$y = 8$$

$y = 8$ を③に代入すると

$$\begin{aligned} -x - 2y &= -3 \\ -x - 2 \times 8 &= -3 \\ -x - 16 &= -3 \\ -x &= 13 \\ x &= -13 \end{aligned}$$

答え $x = -13, y = 8$

$$\begin{cases} -3(x - 3y) - 7y = 15 & \dots\dots ① \\ -2(x - 3y) - 5y = 11 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -3(x - 3y) - 7y &= 15 \\ -3x + 9y - 7y &= 15 \\ -3x + 2y &= 15 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} -2(x - 3y) - 5y &= 11 \\ -2x + 6y - 5y &= 11 \\ -2x + y &= 11 & \dots\dots ④ \end{aligned}$$

$$③ \quad -3x + 2y = 15$$

$$④ \times 2 \quad \begin{array}{r} -) \quad -4x + 2y = 22 \\ \hline x = -7 \end{array}$$

$$x = -7$$

$x = -7$ を④に代入すると

$$\begin{aligned} -2x + y &= 11 \\ -2 \times (-7) + y &= 11 \\ 14 + y &= 11 \\ y &= -3 \end{aligned}$$

答え $x = -7, y = -3$

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

$$\begin{cases} -15x - 4(-3x + y) = -5 \\ 7x + 2(-3x + y) = -3 \end{cases}$$

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

①のかっこをはずすと

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

②のかっこをはずすと

$$\begin{aligned} -2(x+2y)+3y &= 5 \\ -2x-4y+3y &= 5 \\ -2x-y &= 5 & \dots\dots\textcircled{4} \end{aligned}$$

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

$$\textcircled{4} \quad \begin{array}{r} -) -2x-y=5 \\ \underline{-x} \quad \quad = -1 \end{array}$$

$$x=1$$

$x=1$ を③に代入すると

$$\begin{aligned} -3x-y &= 4 \\ -3 \times 1 - y &= 4 \\ -3 - y &= 4 \\ -y &= 7 \\ y &= -7 \end{aligned}$$

答え $x=1, y=-7$

$$\begin{cases} -15x-4(-3x+y)=-5 & \dots\dots\textcircled{1} \\ 7x+2(-3x+y)=-3 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -15x-4(-3x+y) &= -5 \\ -15x+12x-4y &= -5 \\ -3x-4y &= -5 & \dots\dots\textcircled{3} \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 7x+2(-3x+y) &= -3 \\ 7x-6x+2y &= -3 \\ x+2y &= -3 & \dots\dots\textcircled{4} \end{aligned}$$

$$\textcircled{3} \quad -3x-4y=-5$$

$$\textcircled{4} \times 2 \quad \begin{array}{r} +) 2x+4y=-6 \\ \underline{-x} \quad \quad = -11 \end{array}$$

$$x=11$$

$x=11$ を④に代入すると

$$\begin{aligned} x+2y &= -3 \\ 1 \times 11 + 2y &= -3 \\ 11 + 2y &= -3 \\ 2y &= -14 \\ y &= -7 \end{aligned}$$

答え $x=11, y=-7$

$$\begin{cases} -2(2x + 4y) + 11y = 9 \\ 7x - 2(3x + y) = 4 \end{cases}$$

$$\begin{cases} -11x - 6(-2x + y) = 0 \\ 7x + 3(-2x + y) = 18 \end{cases}$$

$$\begin{cases} -2(2x+4y)+11y=9 & \dots\dots\textcircled{1} \\ 7x-2(3x+y)=4 & \dots\dots\textcircled{2} \end{cases} \quad \begin{cases} -11x-6(-2x+y)=0 & \dots\dots\textcircled{1} \\ 7x+3(-2x+y)=18 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -2(2x+4y)+11y &= 9 \\ -4x-8y+11y &= 9 \\ -4x+3y &= 9 & \dots\dots\textcircled{3} \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 7x-2(3x+y) &= 4 \\ 7x-6x-2y &= 4 \\ x-2y &= 4 & \dots\dots\textcircled{4} \end{aligned}$$

$$\textcircled{3} \quad -4x+3y=9$$

$$\textcircled{4} \times 4 \quad +) \quad 4x-8y=16$$

$$-5y=25$$

$$y=-5$$

$y=-5$ を④に代入すると

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

答え $x=-6, y=-5$

①のかっこをはずすと

$$\begin{aligned} -11x-6(-2x+y) &= 0 \\ -11x+12x-6y &= 0 \\ x-6y &= 0 & \dots\dots\textcircled{3} \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 7x+3(-2x+y) &= 18 \\ 7x-6x+3y &= 18 \\ x+3y &= 18 & \dots\dots\textcircled{4} \end{aligned}$$

$$\textcircled{3} \quad x-6y=0$$

$$\textcircled{4} \quad -) \quad x+3y=18$$

$$-9y=-18$$

$$y=2$$

$y=2$ を③に代入すると

$$\begin{aligned} x-6y &= 0 \\ x-6 \times 2 &= 0 \\ x-12 &= 0 \\ x &= 12 \end{aligned}$$

答え $x=12, y=2$

$$\begin{cases} -3(x + 2y) + 4y = 17 \\ 7x - 2(3x + y) = 5 \end{cases}$$

$$\begin{cases} -3(x - 3y) - 7y = 20 \\ 3(x + 3y) - 8y = -8 \end{cases}$$

$$\begin{cases} -3(x+2y)+4y=17 & \dots\dots\textcircled{1} \\ 7x-2(3x+y)=5 & \dots\dots\textcircled{2} \end{cases}$$

$$\begin{cases} -3(x-3y)-7y=20 & \dots\dots\textcircled{1} \\ 3(x+3y)-8y=-8 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -3(x+2y)+4y &= 17 \\ -3x-6y+4y &= 17 \\ -3x-2y &= 17 & \dots\dots\textcircled{3} \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 7x-2(3x+y) &= 5 \\ 7x-6x-2y &= 5 \\ x-2y &= 5 & \dots\dots\textcircled{4} \end{aligned}$$

$$\textcircled{3} \quad -3x-2y=17$$

$$\textcircled{4} \quad \begin{array}{r} -) \quad x-2y=5 \\ \underline{-4x} \quad \quad = 12 \end{array}$$

$$x = -3$$

$x = -3$ を④に代入すると

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

答え $x = -3, y = -4$

①のかっこをはずすと

$$\begin{aligned} -3(x-3y)-7y &= 20 \\ -3x+9y-7y &= 20 \\ -3x+2y &= 20 & \dots\dots\textcircled{3} \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 3(x+3y)-8y &= -8 \\ 3x+9y-8y &= -8 \\ 3x+y &= -8 & \dots\dots\textcircled{4} \end{aligned}$$

$$\textcircled{3} \quad -3x+2y=20$$

$$\textcircled{4} \quad \begin{array}{r} +) \quad 3x+y=-8 \\ \underline{3y} = 12 \end{array}$$

$$y = 4$$

$y = 4$ を④に代入すると

$$\begin{aligned} 3x+y &= -8 \\ 3x+1 \times 4 &= -8 \\ 3x+4 &= -8 \\ 3x &= -12 \\ x &= -4 \end{aligned}$$

答え $x = -4, y = 4$

$$\begin{cases} x + 3(-3x + y) = 13 \\ 2(x - 2y) + 5y = -5 \end{cases}$$

$$\begin{cases} -8x + 3(2x + y) = -18 \\ 7x - 2(3x + y) = 16 \end{cases}$$

$$\begin{cases} x + 3(-3x + y) = 13 & \dots\dots\textcircled{1} \\ 2(x - 2y) + 5y = -5 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} x + 3(-3x + y) &= 13 \\ x - 9x + 3y &= 13 \\ -8x + 3y &= 13 & \dots\dots\textcircled{3} \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 2(x - 2y) + 5y &= -5 \\ 2x - 4y + 5y &= -5 \\ 2x + y &= -5 & \dots\dots\textcircled{4} \end{aligned}$$

$$\begin{array}{r} \textcircled{3} \qquad -8x + 3y = 13 \\ \textcircled{4} \times 3 \quad -) \quad 6x + 3y = -15 \\ \hline \qquad -14x \qquad = 28 \\ \qquad \qquad \qquad x = -2 \end{array}$$

$x = -2$ を④に代入すると

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

答え $x = -2, y = -1$

$$\begin{cases} -8x + 3(2x + y) = -18 & \dots\dots\textcircled{1} \\ 7x - 2(3x + y) = 16 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -8x + 3(2x + y) &= -18 \\ -8x + 6x + 3y &= -18 \\ -2x + 3y &= -18 & \dots\dots\textcircled{3} \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 7x - 2(3x + y) &= 16 \\ 7x - 6x - 2y &= 16 \\ x - 2y &= 16 & \dots\dots\textcircled{4} \end{aligned}$$

$$\begin{array}{r} \textcircled{3} \qquad -2x + 3y = -18 \\ \textcircled{4} \times 2 \quad +) \quad 2x - 4y = 32 \\ \hline \qquad \qquad -y = 14 \\ \qquad \qquad \qquad y = -14 \end{array}$$

$y = -14$ を④に代入すると

$$\begin{aligned} x - 2y &= 16 \\ x - 2 \times (-14) &= 16 \\ x + 28 &= 16 \\ x &= -12 \end{aligned}$$

答え $x = -12, y = -14$

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

$$\begin{cases} -2(2x + 3y) + 7y = 42 \\ 2(x + 3y) - 7y = -18 \end{cases}$$

$$\begin{cases} 2(x+3y) - 7y = 5 & \dots\dots ① \\ 2(2x+1) - y = -3 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} 2(x+3y) - 7y &= 5 \\ 2x + 6y - 7y &= 5 \\ 2x - y &= 5 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

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

$$③ \quad 2x - y = 5$$

$$④ \quad \begin{array}{r} -) \quad 4x - y = -5 \\ \underline{-2x} \quad \quad = 10 \end{array}$$

$$x = -5$$

$x = -5$ を③に代入すると

$$\begin{aligned} 2x - y &= 5 \\ 2 \times (-5) - y &= 5 \\ -10 - y &= 5 \\ -y &= 15 \\ y &= -15 \end{aligned}$$

答え $x = -5, y = -15$

$$\begin{cases} -2(2x+3y) + 7y = 42 & \dots\dots ① \\ 2(x+3y) - 7y = -18 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -2(2x+3y) + 7y &= 42 \\ -4x - 6y + 7y &= 42 \\ -4x + y &= 42 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 2(x+3y) - 7y &= -18 \\ 2x + 6y - 7y &= -18 \\ 2x - y &= -18 & \dots\dots ④ \end{aligned}$$

$$③ \quad -4x + y = 42$$

$$④ \quad \begin{array}{r} +) \quad 2x - y = -18 \\ \underline{-2x} \quad \quad = 24 \end{array}$$

$$x = -12$$

$x = -12$ を④に代入すると

$$\begin{aligned} 2x - y &= -18 \\ 2 \times (-12) - y &= -18 \\ -24 - y &= -18 \\ -y &= 6 \\ y &= -6 \end{aligned}$$

答え $x = -12, y = -6$

$$\begin{cases} -5(x - 3y) - 7y = 17 \\ 5x + 2(-3x + y) = 3 \end{cases}$$

$$\begin{cases} 3x - 2(2x + y) = 9 \\ -17x + 6(3x + y) = -45 \end{cases}$$

$$\begin{cases} -5(x-3y)-7y=17 & \dots\dots\textcircled{1} \\ 5x+2(-3x+y)=3 & \dots\dots\textcircled{2} \end{cases}$$

$$\begin{cases} 3x-2(2x+y)=9 & \dots\dots\textcircled{1} \\ -17x+6(3x+y)=-45 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -5(x-3y)-7y &= 17 \\ -5x+15y-7y &= 17 \\ -5x+8y &= 17 & \dots\dots\textcircled{3} \end{aligned}$$

②のかっこをはずすと

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

$$\textcircled{3} \quad -5x+8y=17$$

$$\textcircled{4} \times 4 \quad \begin{array}{r} - \\ -4x+8y=12 \\ \hline -x \quad = 5 \end{array}$$

$$x = -5$$

$x = -5$ を④に代入すると

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

答え $x = -5, y = -1$

①のかっこをはずすと

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

②のかっこをはずすと

$$\begin{aligned} -17x+6(3x+y) &= -45 \\ -17x+18x+6y &= -45 \\ x+6y &= -45 & \dots\dots\textcircled{4} \end{aligned}$$

$$\textcircled{3} \quad -x-2y=9$$

$$\textcircled{4} \quad \begin{array}{r} + \\ x+6y=-45 \\ \hline 4y=-36 \end{array}$$

$$y = -9$$

$y = -9$ を③に代入すると

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

答え $x = 9, y = -9$

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

$$\begin{cases} -9x - 2(-3x + y) = 6 \\ 5x + 2(-2x + 2y) = 8 \end{cases}$$

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

$$\begin{cases} -9x - 2(-3x + y) = 6 & \dots\dots ① \\ 5x + 2(-2x + 2y) = 8 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -8x - 5(-2x + y) &= 2 \\ -8x + 10x - 5y &= 2 \\ 2x - 5y &= 2 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 3(x - 3y) + 2y &= 1 \\ 3x - 9y + 2y &= 1 \\ 3x - 7y &= 1 & \dots\dots ④ \end{aligned}$$

$$③ \times 3 \quad 6x - 15y = 6$$

$$④ \times 2 \quad \begin{array}{r} -6x - 14y = 2 \\ \hline -y = 4 \end{array}$$

$$y = -4$$

$y = -4$ を③に代入すると

$$\begin{aligned} 2x - 5y &= 2 \\ 2x - 5 \times (-4) &= 2 \\ 2x + 20 &= 2 \\ 2x &= -18 \\ x &= -9 \end{aligned}$$

答え $x = -9, y = -4$

①のかっこをはずすと

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

②のかっこをはずすと

$$\begin{aligned} 5x + 2(-2x + 2y) &= 8 \\ 5x - 4x + 4y &= 8 \\ x + 4y &= 8 & \dots\dots ④ \end{aligned}$$

$$③ \times 2 \quad -6x - 4y = 12$$

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

$$x = -4$$

$x = -4$ を④に代入すると

$$\begin{aligned} x + 4y &= 8 \\ 1 \times (-4) + 4y &= 8 \\ -4 + 4y &= 8 \\ 4y &= 12 \\ y &= 3 \end{aligned}$$

答え $x = -4, y = 3$

$$\begin{cases} -22x + 9(2x + y) = -11 \\ 5x - 3(2x + y) = -8 \end{cases}$$

$$\begin{cases} 2(x + 3y) - 7y = 24 \\ 2(x - 2y) + 5y = 16 \end{cases}$$

$$\begin{cases} -22x + 9(2x + y) = -11 & \dots\dots ① \\ 5x - 3(2x + y) = -8 & \dots\dots ② \end{cases} \quad \begin{cases} 2(x + 3y) - 7y = 24 & \dots\dots ① \\ 2(x - 2y) + 5y = 16 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -22x + 9(2x + y) &= -11 \\ -22x + 18x + 9y &= -11 \\ -4x + 9y &= -11 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 5x - 3(2x + y) &= -8 \\ 5x - 6x - 3y &= -8 \\ -x - 3y &= -8 & \dots\dots ④ \end{aligned}$$

$$③ \quad -4x + 9y = -11$$

$$④ \times 3 \quad \begin{array}{r} +) -3x - 9y = -24 \\ \hline -7x \quad \quad = -35 \end{array}$$

$$x = 5$$

$x = 5$ を④に代入すると

$$\begin{aligned} -x - 3y &= -8 \\ -1 \times 5 - 3y &= -8 \\ -5 - 3y &= -8 \\ -3y &= -3 \\ y &= 1 \end{aligned}$$

答え $x = 5, y = 1$

①のかっこをはずすと

$$\begin{aligned} 2(x + 3y) - 7y &= 24 \\ 2x + 6y - 7y &= 24 \\ 2x - y &= 24 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 2(x - 2y) + 5y &= 16 \\ 2x - 4y + 5y &= 16 \\ 2x + y &= 16 & \dots\dots ④ \end{aligned}$$

$$③ \quad 2x - y = 24$$

$$④ \quad \begin{array}{r} -) 2x + y = 16 \\ \hline -2y = 8 \end{array}$$

$$y = -4$$

$y = -4$ を④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 $x = 10, y = -4$

問題

かっこを含む連立方程式を解いてみましょう。

$$\begin{cases} -2x + 3y = 15 \\ -5x - 3(-2x + y) = -24 \end{cases}$$

$$\begin{cases} 7x + 2(-3x + y) = -9 \\ 2x - y = 7 \end{cases}$$

$$\begin{cases} -2x + 3y = 15 & \dots\dots ① \\ -5x - 3(-2x + y) = -24 & \dots\dots ② \end{cases} \quad \begin{cases} 7x + 2(-3x + y) = -9 & \dots\dots ① \\ 2x - y = 7 & \dots\dots ② \end{cases}$$

②のかっこをはずすと

$$\begin{aligned} -5x - 3(-2x + y) &= -24 \\ -5x + 6x - 3y &= -24 \\ x - 3y &= -24 \quad \dots\dots ③ \end{aligned}$$

$$① \quad -2x + 3y = 15$$

$$③ \quad \begin{array}{r} +) \quad x - 3y = -24 \\ \hline -x \quad \quad = -9 \end{array}$$

$$x = 9$$

$x = 9$ を①に代入すると

$$\begin{aligned} -2x + 3y &= 15 \\ -2 \times 9 + 3y &= 15 \\ -18 + 3y &= 15 \\ 3y &= 33 \\ y &= 11 \end{aligned}$$

答え $x = 9, y = 11$

①のかっこをはずすと

$$\begin{aligned} 7x + 2(-3x + y) &= -9 \\ 7x - 6x + 2y &= -9 \\ x + 2y &= -9 \quad \dots\dots ③ \end{aligned}$$

$$③ \times 2 \quad 2x + 4y = -18$$

$$② \quad \begin{array}{r} -) 2x - y = 7 \\ \hline 5y = -25 \end{array}$$

$$y = -5$$

$y = -5$ を②に代入すると

$$\begin{aligned} 2x - y &= 7 \\ 2x - 1 \times (-5) &= 7 \\ 2x + 5 &= 7 \\ 2x &= 2 \\ x &= 1 \end{aligned}$$

答え $x = 1, y = -5$

$$\begin{cases} -13x + 3(3x + y) = -7 \\ 3x + 2(-3x + y) = -4 \end{cases}$$

$$\begin{cases} -3x + 2y = -23 \\ 3(x + 3y) - 8y = -16 \end{cases}$$

$$\begin{cases} -13x + 3(3x + y) = -7 & \dots\dots ① \\ 3x + 2(-3x + y) = -4 & \dots\dots ② \end{cases} \quad \begin{cases} -3x + 2y = -23 & \dots\dots ① \\ 3(x + 3y) - 8y = -16 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -13x + 3(3x + y) &= -7 \\ -13x + 9x + 3y &= -7 \\ -4x + 3y &= -7 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

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

$$③ \times 2 \quad -8x + 6y = -14$$

$$④ \times 3 \quad \begin{array}{r} -9x + 6y = -12 \\ \hline x = -2 \end{array}$$

$$x = -2$$

$x = -2$ を④に代入すると

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

答え $x = -2, y = -5$

②のかっこをはずすと

$$\begin{aligned} 3(x + 3y) - 8y &= -16 \\ 3x + 9y - 8y &= -16 \\ 3x + y &= -16 & \dots\dots ③ \end{aligned}$$

$$① \quad -3x + 2y = -23$$

$$③ \quad \begin{array}{r} +) 3x + y = -16 \\ \hline 3y = -39 \\ y = -13 \end{array}$$

$y = -13$ を③に代入すると

$$\begin{aligned} 3x + y &= -16 \\ 3x + 1 \times (-13) &= -16 \\ 3x - 13 &= -16 \\ 3x &= -3 \\ x &= -1 \end{aligned}$$

答え $x = -1, y = -13$

$$\begin{cases} 2(x + 3y) - 7y = 2 \\ 4x + y = 34 \end{cases}$$

$$\begin{cases} 2x - y = 0 \\ 18x - 5(2x + y) = -4 \end{cases}$$

$$\begin{cases} 2(x+3y) - 7y = 2 & \dots\dots ① \\ 4x + y = 34 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} 2(x+3y) - 7y &= 2 \\ 2x + 6y - 7y &= 2 \\ 2x - y &= 2 \quad \dots\dots ③ \end{aligned}$$

$$③ \quad 2x - y = 2$$

$$② \quad \begin{array}{r} +) 4x + y = 34 \\ \hline 6x \quad = 36 \end{array}$$

$$x = 6$$

$x = 6$ を③に代入すると

$$\begin{aligned} 2x - y &= 2 \\ 2 \times 6 - y &= 2 \\ 12 - y &= 2 \\ -y &= -10 \\ y &= 10 \end{aligned}$$

答え $x = 6, y = 10$

$$\begin{cases} 2x - y = 0 & \dots\dots ① \\ 18x - 5(2x + y) = -4 & \dots\dots ② \end{cases}$$

②のかっこをはずすと

$$\begin{aligned} 18x - 5(2x + y) &= -4 \\ 18x - 10x - 5y &= -4 \\ 8x - 5y &= -4 \quad \dots\dots ③ \end{aligned}$$

$$① \times 4 \quad 8x - 4y = 0$$

$$③ \quad \begin{array}{r} -) 8x - 5y = -4 \\ \hline y = 4 \end{array}$$

$$y = 4$$

$y = 4$ を①に代入すると

$$\begin{aligned} 2x - y &= 0 \\ 2x - 1 \times 4 &= 0 \\ 2x - 4 &= 0 \\ 2x &= 4 \\ x &= 2 \end{aligned}$$

答え $x = 2, y = 4$

$$\begin{cases} x + 3(-3x + y) = 31 \\ -2(x - 3y) - 5y = 11 \end{cases}$$

$$\begin{cases} -2(x - 3y) - 5y = -11 \\ 2(2x - 2y) + 5y = 13 \end{cases}$$

$$\begin{cases} x + 3(-3x + y) = 31 & \dots\dots ① \\ -2(x - 3y) - 5y = 11 & \dots\dots ② \end{cases}$$

$$\begin{cases} -2(x - 3y) - 5y = -11 & \dots\dots ① \\ 2(2x - 2y) + 5y = 13 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} x + 3(-3x + y) &= 31 \\ x - 9x + 3y &= 31 \\ -8x + 3y &= 31 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} -2(x - 3y) - 5y &= 11 \\ -2x + 6y - 5y &= 11 \\ -2x + y &= 11 & \dots\dots ④ \end{aligned}$$

$$③ \quad -8x + 3y = 31$$

$$④ \times 3 \quad \begin{array}{r} -) -6x + 3y = 33 \\ \underline{-2x} \quad \quad = -2 \end{array}$$

$$x = 1$$

$x = 1$ を④に代入すると

$$\begin{aligned} -2x + y &= 11 \\ -2 \times 1 + y &= 11 \\ -2 + y &= 11 \\ y &= 13 \end{aligned}$$

答え $x = 1, y = 13$

①のかっこをはずすと

$$\begin{aligned} -2(x - 3y) - 5y &= -11 \\ -2x + 6y - 5y &= -11 \\ -2x + y &= -11 & \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 2(2x - 2y) + 5y &= 13 \\ 4x - 4y + 5y &= 13 \\ 4x + y &= 13 & \dots\dots ④ \end{aligned}$$

$$③ \quad -2x + y = -11$$

$$④ \quad \begin{array}{r} -) 4x + y = 13 \\ \underline{-6x} \quad \quad = -24 \end{array}$$

$$x = 4$$

$x = 4$ を③に代入すると

$$\begin{aligned} -2x + y &= -11 \\ -2 \times 4 + y &= -11 \\ -8 + y &= -11 \\ y &= -3 \end{aligned}$$

答え $x = 4, y = -3$

$$\begin{cases} -x + 2(2y + 2) = 30 \\ 7x - 2(3x + y) = -10 \end{cases}$$

$$\begin{cases} x + 2y = 6 \\ 12x + 5(-2x + y) = 14 \end{cases}$$

$$\begin{cases} -x + 2(2y + 2) = 30 & \dots\dots ① \\ 7x - 2(3x + y) = -10 & \dots\dots ② \end{cases}$$

$$\begin{cases} x + 2y = 6 & \dots\dots ① \\ 12x + 5(-2x + y) = 14 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -x + 2(2y + 2) &= 30 \\ -x + 4y + 4 &= 30 \\ -x + 4y &= 26 \quad \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 7x - 2(3x + y) &= -10 \\ 7x - 6x - 2y &= -10 \\ x - 2y &= -10 \quad \dots\dots ④ \end{aligned}$$

$$③ \quad -x + 4y = 26$$

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

$$y = 8$$

$y = 8$ を④に代入すると

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

答え $x = 6, y = 8$

②のかっこをはずすと

$$\begin{aligned} 12x + 5(-2x + y) &= 14 \\ 12x - 10x + 5y &= 14 \\ 2x + 5y &= 14 \quad \dots\dots ③ \end{aligned}$$

$$① \times 2 \quad 2x + 4y = 12$$

$$③ \quad \begin{array}{r} -) 2x + 5y = 14 \\ \hline \quad \quad -y = -2 \\ \quad \quad \quad y = 2 \end{array}$$

$y = 2$ を①に代入すると

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

答え $x = 2, y = 2$

$$\begin{cases} 2(x + 3y) - 7y = 3 \\ 5x - 8y = -9 \end{cases}$$

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

$$\begin{cases} 2(x+3y) - 7y = 3 & \dots\dots ① \\ 5x - 8y = -9 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} 2(x+3y) - 7y &= 3 \\ 2x + 6y - 7y &= 3 \\ 2x - y &= 3 \quad \dots\dots ③ \end{aligned}$$

$$③ \times 5 \quad 10x - 5y = 15$$

$$② \times 2 \quad \underline{-) 10x - 16y = -18}$$

$$11y = 33$$

$$y = 3$$

$y = 3$ を③に代入すると

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

答え $x = 3, y = 3$

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

②のかっこをはずすと

$$\begin{aligned} -5x - 3(-2x + y) &= 1 \\ -5x + 6x - 3y &= 1 \\ x - 3y &= 1 \quad \dots\dots ③ \end{aligned}$$

$$① \quad x - 6y = 4$$

$$③ \quad \underline{-) x - 3y = 1}$$

$$-3y = 3$$

$$y = -1$$

$y = -1$ を③に代入すると

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

答え $x = -2, y = -1$

$$\begin{cases} 2(x - 2y) + 5y = -3 \\ 9x + 4y = -15 \end{cases}$$

$$\begin{cases} 5x + 2(-3x + y) = -14 \\ -13x + 6(2x + y) = -26 \end{cases}$$

$$\begin{cases} 2(x-2y)+5y=-3 & \dots\dots\textcircled{1} \\ 9x+4y=-15 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} 2(x-2y)+5y &= -3 \\ 2x-4y+5y &= -3 \\ 2x+y &= -3 & \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{3} \times 4 \quad 8x+4y = -12$$

$$\begin{array}{r} \textcircled{2} \quad -) 9x+4y = -15 \\ \underline{-x} \quad \quad = 3 \\ x = -3 \end{array}$$

$x = -3$ を③に代入すると

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

答え $x = -3, y = 3$

$$\begin{cases} 5x+2(-3x+y)=-14 & \dots\dots\textcircled{1} \\ -13x+6(2x+y)=-26 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} 5x+2(-3x+y) &= -14 \\ 5x-6x+2y &= -14 \\ -x+2y &= -14 & \dots\dots\textcircled{3} \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} -13x+6(2x+y) &= -26 \\ -13x+12x+6y &= -26 \\ -x+6y &= -26 & \dots\dots\textcircled{4} \end{aligned}$$

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

$$\begin{array}{r} \textcircled{4} \quad -) -x+6y = -26 \\ \underline{-4y} = 12 \\ y = -3 \end{array}$$

$y = -3$ を③に代入すると

$$\begin{aligned} -x+2y &= -14 \\ -x+2 \times (-3) &= -14 \\ -x-6 &= -14 \\ -x &= -8 \\ x &= 8 \end{aligned}$$

答え $x = 8, y = -3$

$$\begin{cases} 5x + 2(-3x + y) = 5 \\ -9x + 4(2x + y) = -1 \end{cases}$$

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

$$\begin{cases} 5x + 2(-3x + y) = 5 & \dots\dots ① \\ -9x + 4(2x + y) = -1 & \dots\dots ② \end{cases}$$

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

①のかっこをはずすと

$$\begin{aligned} 5x + 2(-3x + y) &= 5 \\ 5x - 6x + 2y &= 5 \\ -x + 2y &= 5 \quad \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} -9x + 4(2x + y) &= -1 \\ -9x + 8x + 4y &= -1 \\ -x + 4y &= -1 \quad \dots\dots ④ \end{aligned}$$

$$③ \quad -x + 2y = 5$$

$$④ \quad \begin{array}{r} -) -x + 4y = -1 \\ \underline{-2y = 6} \end{array}$$

$$y = -3$$

$y = -3$ を③に代入すると

$$\begin{aligned} -x + 2y &= 5 \\ -x + 2 \times (-3) &= 5 \\ -x - 6 &= 5 \\ -x &= 11 \\ x &= -11 \end{aligned}$$

答え $x = -11, y = -3$

①のかっこをはずすと

$$\begin{aligned} -2(x + 4y) + 3y &= -4 \\ -2x - 8y + 3y &= -4 \\ -2x - 5y &= -4 \quad \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 7x + 2(-3x + y) &= 1 \\ 7x - 6x + 2y &= 1 \\ x + 2y &= 1 \quad \dots\dots ④ \end{aligned}$$

$$③ \quad -2x - 5y = -4$$

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

$$y = 2$$

$y = 2$ を④に代入すると

$$\begin{aligned} x + 2y &= 1 \\ x + 2 \times 2 &= 1 \\ x + 4 &= 1 \\ x &= -3 \end{aligned}$$

答え $x = -3, y = 2$

$$\begin{cases} 7x - 2(3x + y) = -6 \\ 7x + 2(-3x + y) = -18 \end{cases}$$

$$\begin{cases} 7x + 2(-3x + y) = -12 \\ 2(x - 2y) + 7y = -23 \end{cases}$$

$$\begin{cases} 7x - 2(3x + y) = -6 & \dots\dots ① \\ 7x + 2(-3x + y) = -18 & \dots\dots ② \end{cases} \quad \begin{cases} 7x + 2(-3x + y) = -12 & \dots\dots ① \\ 2(x - 2y) + 7y = -23 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} 7x - 2(3x + y) &= -6 \\ 7x - 6x - 2y &= -6 \\ x - 2y &= -6 \quad \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 7x + 2(-3x + y) &= -18 \\ 7x - 6x + 2y &= -18 \\ x + 2y &= -18 \quad \dots\dots ④ \end{aligned}$$

$$③ \quad x - 2y = -6$$

$$④ \quad \begin{array}{r} -)x + 2y = -18 \\ \hline -4y = 12 \end{array}$$

$$y = -3$$

$y = -3$ を③に代入すると

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

答え $x = -12, y = -3$

①のかっこをはずすと

$$\begin{aligned} 7x + 2(-3x + y) &= -12 \\ 7x - 6x + 2y &= -12 \\ x + 2y &= -12 \quad \dots\dots ③ \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 2(x - 2y) + 7y &= -23 \\ 2x - 4y + 7y &= -23 \\ 2x + 3y &= -23 \quad \dots\dots ④ \end{aligned}$$

$$③ \times 2 \quad 2x + 4y = -24$$

$$④ \quad \begin{array}{r} -)2x + 3y = -23 \\ \hline y = -1 \end{array}$$

$$y = -1$$

$y = -1$ を③に代入すると

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

答え $x = -10, y = -1$

$$\begin{cases} 7x + 2(-3x + y) = -2 \\ 6x + 7y = -17 \end{cases}$$

$$\begin{cases} -3x + 4(2y + 13) = 86 \\ x - 2y = -12 \end{cases}$$

$$\begin{cases} 7x + 2(-3x + y) = -2 & \dots\dots ① \\ 6x + 7y = -17 & \dots\dots ② \end{cases}$$

$$\begin{cases} -3x + 4(2y + 13) = 86 & \dots\dots ① \\ x - 2y = -12 & \dots\dots ② \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} 7x + 2(-3x + y) &= -2 \\ 7x - 6x + 2y &= -2 \\ x + 2y &= -2 \quad \dots\dots ③ \end{aligned}$$

$$③ \times 6 \quad 6x + 12y = -12$$

$$② \quad \frac{-)6x + 7y = -17}{5y = 5}$$

$$y = 1$$

$y = 1$ を③に代入すると

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

答え $x = -4, y = 1$

①のかっこをはずすと

$$\begin{aligned} -3x + 4(2y + 13) &= 86 \\ -3x + 8y + 52 &= 86 \\ -3x + 8y &= 34 \quad \dots\dots ③ \end{aligned}$$

$$③ \quad -3x + 8y = 34$$

$$② \times 3 \quad \frac{+) 3x - 6y = -36}{2y = -2}$$

$$y = -1$$

$y = -1$ を②に代入すると

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

答え $x = -14, y = -1$

$$\begin{cases} 2x - y = -4 \\ 7(x + 2y) - 13y = -5 \end{cases}$$

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

$$\begin{cases} 2x - y = -4 & \dots\dots ① \\ 7(x + 2y) - 13y = -5 & \dots\dots ② \end{cases}$$

②のかっこをはずすと

$$\begin{aligned} 7(x + 2y) - 13y &= -5 \\ 7x + 14y - 13y &= -5 \\ 7x + y &= -5 \quad \dots\dots ③ \end{aligned}$$

$$① \quad 2x - y = -4$$

$$③ \quad \begin{array}{r} +) 7x + y = -5 \\ \hline 9x \quad = -9 \end{array}$$

$$x = -1$$

$x = -1$ を①に代入すると

$$2x - y = -4$$

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

$$-2 - y = -4$$

$$-y = -2$$

$$y = 2$$

答え $x = -1, y = 2$

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

①のかっこをはずすと

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

②のかっこをはずすと

$$\begin{aligned} 2(x - 2y) + 7y &= 8 \\ 2x - 4y + 7y &= 8 \\ 2x + 3y &= 8 \quad \dots\dots ④ \end{aligned}$$

$$③ \quad -2x - y = 4$$

$$④ \quad \begin{array}{r} +) 2x + 3y = 8 \\ \hline 2y = 12 \end{array}$$

$$y = 6$$

$y = 6$ を③に代入すると

$$-2x - y = 4$$

$$-2x - 1 \times 6 = 4$$

$$-2x - 6 = 4$$

$$-2x = 10$$

$$x = -5$$

答え $x = -5, y = 6$

$$\begin{cases} -2(x - 3y) - 5y = 11 \\ 9x - 2(3x + y) = -10 \end{cases}$$

$$\begin{cases} -11x - 6(-2x + y) = 17 \\ x - 3y = 8 \end{cases}$$

$$\begin{cases} -2(x-3y)-5y=11 & \dots\dots\textcircled{1} \\ 9x-2(3x+y)=-10 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -2(x-3y)-5y &= 11 \\ -2x+6y-5y &= 11 \\ -2x+y &= 11 & \dots\dots\textcircled{3} \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 9x-2(3x+y) &= -10 \\ 9x-6x-2y &= -10 \\ 3x-2y &= -10 & \dots\dots\textcircled{4} \end{aligned}$$

$$\textcircled{3} \times 2 \quad -4x+2y = 22$$

$$\begin{array}{r} \textcircled{4} \quad +) \quad 3x-2y = -10 \\ \quad \quad \quad -x \quad \quad = 12 \\ \quad \quad \quad \quad \quad \quad x = -12 \end{array}$$

$x = -12$ を③に代入すると

$$\begin{aligned} -2x+y &= 11 \\ -2 \times (-12)+y &= 11 \\ 24+y &= 11 \\ y &= -13 \end{aligned}$$

答え $x = -12, y = -13$

$$\begin{cases} -11x-6(-2x+y)=17 & \dots\dots\textcircled{1} \\ x-3y=8 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -11x-6(-2x+y) &= 17 \\ -11x+12x-6y &= 17 \\ x-6y &= 17 & \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{3} \quad x-6y = 17$$

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

$y = -3$ を②に代入すると

$$\begin{aligned} x-3y &= 8 \\ x-3 \times (-3) &= 8 \\ x+9 &= 8 \\ x &= -1 \end{aligned}$$

答え $x = -1, y = -3$

$$\begin{cases} -2x + y = -6 \\ 5x + 2(-2x + 2y) = -15 \end{cases}$$

$$\begin{cases} -5x - 3(-2x + y) = -19 \\ 2x + y = 4 \end{cases}$$

$$\begin{cases} -2x + y = -6 & \dots\dots ① \\ 5x + 2(-2x + 2y) = -15 & \dots\dots ② \end{cases} \quad \begin{cases} -5x - 3(-2x + y) = -19 & \dots\dots ① \\ 2x + y = 4 & \dots\dots ② \end{cases}$$

②のかっこをはずすと

$$\begin{aligned} 5x + 2(-2x + 2y) &= -15 \\ 5x - 4x + 4y &= -15 \\ x + 4y &= -15 \quad \dots\dots ③ \end{aligned}$$

$$① \quad -2x + y = -6$$

$$③ \times 2 \quad +) \quad \underline{2x + 8y = -30}$$

$$9y = -36$$

$$y = -4$$

$y = -4$ を①に代入すると

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

答え $x = 1, y = -4$

①のかっこをはずすと

$$\begin{aligned} -5x - 3(-2x + y) &= -19 \\ -5x + 6x - 3y &= -19 \\ x - 3y &= -19 \quad \dots\dots ③ \end{aligned}$$

$$③ \times 2 \quad 2x - 6y = -38$$

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

$$-7y = -42$$

$$y = 6$$

$y = 6$ を②に代入すると

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

答え $x = -1, y = 6$

$$\begin{cases} -21x + 2(6x + y) = 30 \\ 3(x + 3y) - 8y = 0 \end{cases}$$

$$\begin{cases} -3(x + 4y) + 8y = -23 \\ -3x - 2y = 5 \end{cases}$$

$$\begin{cases} -21x + 2(6x + y) = 30 & \dots\dots\textcircled{1} \\ 3(x + 3y) - 8y = 0 & \dots\dots\textcircled{2} \end{cases}$$

$$\begin{cases} -3(x + 4y) + 8y = -23 & \dots\dots\textcircled{1} \\ -3x - 2y = 5 & \dots\dots\textcircled{2} \end{cases}$$

①のかっこをはずすと

$$\begin{aligned} -21x + 2(6x + y) &= 30 \\ -21x + 12x + 2y &= 30 \\ -9x + 2y &= 30 & \dots\dots\textcircled{3} \end{aligned}$$

②のかっこをはずすと

$$\begin{aligned} 3(x + 3y) - 8y &= 0 \\ 3x + 9y - 8y &= 0 \\ 3x + y &= 0 & \dots\dots\textcircled{4} \end{aligned}$$

$$\textcircled{3} \quad -9x + 2y = 30$$

$$\begin{array}{r} \textcircled{4} \times 2 \quad -) \quad 6x + 2y = 0 \\ \underline{-15x} \quad \quad = 30 \\ x = -2 \end{array}$$

$x = -2$ を④に代入すると

$$\begin{aligned} 3x + y &= 0 \\ 3 \times (-2) + y &= 0 \\ -6 + y &= 0 \\ y &= 6 \end{aligned}$$

答え $x = -2, y = 6$

①のかっこをはずすと

$$\begin{aligned} -3(x + 4y) + 8y &= -23 \\ -3x - 12y + 8y &= -23 \\ -3x - 4y &= -23 & \dots\dots\textcircled{3} \end{aligned}$$

$$\textcircled{3} \quad -3x - 4y = -23$$

$$\begin{array}{r} \textcircled{2} \quad -) \quad -3x - 2y = 5 \\ \underline{-2y} = -28 \\ y = 14 \end{array}$$

$y = 14$ を②に代入すると

$$\begin{aligned} -3x - 2y &= 5 \\ -3x - 2 \times 14 &= 5 \\ -3x - 28 &= 5 \\ -3x &= 33 \\ x &= -11 \end{aligned}$$

答え $x = -11, y = 14$