

7.1

$$1) \begin{cases} 2x + 3y + 2z = 41 \\ 8x + 5y = 31 \\ 7y = 21 \end{cases}$$

En changeant l'ordre des variables, on constate que ce système est déjà échelonné :

$$\begin{cases} 2z + 2x + 3y = 41 \\ 8x + 5y = 31 \\ 7y = 21 \end{cases} \left| \begin{array}{c} \\ \\ \frac{1}{7} \end{array} \right.$$

$$\begin{cases} 2z + 2x + 3y = 41 \\ 8x + 5y = 31 \\ y = 3 \end{cases} \left| \begin{array}{c} 1 \\ \\ -3 \end{array} \right| \begin{array}{c} \\ 1 \\ -5 \end{array}$$

$$\begin{cases} 2z + 2x = 32 \\ 8x = 16 \\ y = 3 \end{cases} \left| \begin{array}{c} \frac{1}{2} \\ \frac{1}{8} \\ \end{array} \right.$$

$$\begin{cases} z + x = 16 \\ x = 2 \\ y = 3 \end{cases} \left| \begin{array}{c} 1 \\ -1 \\ \end{array} \right.$$

$$\begin{cases} z = 14 \\ x = 2 \\ y = 3 \end{cases}$$

$$S = \{(2; 3; 14)\}$$

$$2) \begin{cases} 2x - 3y + 2z = 41 \\ 5x + 3y = 10 - z \\ 9x = 27 \end{cases}$$

Commençons par réarranger ce système :

$$\begin{cases} -3y + 2z + 2x = 41 \\ 3y + z + 5x = 10 \\ x = 3 \end{cases} \left| \begin{array}{c} 1 \\ \\ -2 \end{array} \right| \begin{array}{c} \\ 1 \\ -5 \end{array}$$

$$\begin{cases} -3y + 2z = 35 \\ 3y + z = -5 \\ x = 3 \end{cases} \left| \begin{array}{c} 1 \\ 1 \\ \end{array} \right.$$

$$\begin{cases} -3y + 2z = 35 \\ 3z = 30 \\ x = 3 \end{cases} \left| \begin{array}{c} \\ \frac{1}{10} \\ \end{array} \right.$$

$$\begin{cases} -3y + 2z = 35 \\ z = 10 \\ x = 3 \end{cases} \left| \begin{array}{c} 1 \\ -2 \\ \end{array} \right.$$

$$\left\{ \begin{array}{rcl} -3y & = & 15 \\ & z & = 10 \\ & x & = 3 \end{array} \right| -\frac{1}{3}$$

$$\left\{ \begin{array}{rcl} y & = & -5 \\ & z & = 10 \\ & x & = 3 \end{array} \right.$$

$$S = \{(3; -5; 10)\}$$

$$3) \left\{ \begin{array}{rcl} 7x - 4y - 5z & = & 56 \\ & 3y - 2z & = 13 \\ 5x - 3y & = & 22 \end{array} \right| \begin{array}{l} 5 \\ -7 \end{array}$$

$$\left\{ \begin{array}{rcl} 7x - 4y - 5z & = & 56 \\ & 3y - 2z & = 13 \\ & y - 25z & = 126 \end{array} \right| \begin{array}{l} 1 \\ -3 \end{array}$$

$$\left\{ \begin{array}{rcl} 7x - 4y - 5z & = & 56 \\ & 3y - 2z & = 13 \\ & 73z & = -365 \end{array} \right| \frac{1}{73}$$

$$\left\{ \begin{array}{rcl} 7x - 4y - 5z & = & 56 \\ & 3y - 2z & = 13 \\ & z & = -5 \end{array} \right| \begin{array}{l} 1 \\ 5 \end{array} \left| \begin{array}{l} 1 \\ 2 \end{array} \right.$$

$$\left\{ \begin{array}{rcl} 7x - 4y & = & 31 \\ & 3y & = 3 \\ & z & = -5 \end{array} \right| \begin{array}{l} 3 \\ 4 \end{array}$$

$$\left\{ \begin{array}{rcl} 21x & = & 105 \\ & 3y & = 3 \\ & z & = -5 \end{array} \right| \begin{array}{l} \frac{1}{21} \\ \frac{1}{3} \end{array}$$

$$\left\{ \begin{array}{rcl} x & = & 5 \\ & y & = 1 \\ & z & = -5 \end{array} \right.$$

$$S = \{(5; 1; -5)\}$$

$$4) \left\{ \begin{array}{l} x + y + z = 25 \\ x - y + z = 5 \\ x + 2z = 2y - 10 \end{array} \right.$$

$$\left\{ \begin{array}{rcl} x + y + z & = & 25 \\ x - y + z & = & 5 \\ x - 2y + 2z & = & -10 \end{array} \right| \begin{array}{l} 1 \\ -1 \end{array} \left| \begin{array}{l} 1 \\ -1 \end{array} \right.$$

$$\left\{ \begin{array}{rcl} x + y + z & = & 25 \\ & 2y & = 20 \\ & 3y - z & = 35 \end{array} \right.$$

En réordonnant les variables, en divisant la deuxième équation par 2 et en permutant les deux dernières équations, on obtient :

$$\left\{ \begin{array}{l} x + z + y = 25 \\ -z + 3y = 35 \\ y = 10 \end{array} \right| \begin{array}{l} 1 \\ -1 \end{array} \left| \begin{array}{l} -1 \\ 1 \end{array} \right.$$

$$\left\{ \begin{array}{l} x + z = 15 \\ z = -5 \\ y = 10 \end{array} \right| \begin{array}{l} 1 \\ -1 \end{array}$$

$$\left\{ \begin{array}{l} x = 20 \\ z = -5 \\ y = 10 \end{array} \right.$$

$$S = \{(20; 10; -5)\}$$

$$5) \left\{ \begin{array}{l} x - y - z = 6 \\ x - 2y - 3z = 10 \\ 5x + 6y + z = 2 \end{array} \right| \begin{array}{l} 1 \\ -1 \end{array} \left| \begin{array}{l} -5 \\ 1 \end{array} \right.$$

$$\left\{ \begin{array}{l} x - y - z = 6 \\ y + 2z = -4 \\ 11y + 6z = -28 \end{array} \right| \begin{array}{l} -11 \\ 1 \end{array}$$

$$\left\{ \begin{array}{l} x - y - z = 6 \\ y + 2z = -4 \\ -16z = 16 \end{array} \right| \begin{array}{l} -\frac{1}{16} \end{array}$$

$$\left\{ \begin{array}{l} x - y - z = 6 \\ y + 2z = -4 \\ z = -1 \end{array} \right| \begin{array}{l} 1 \\ 1 \end{array} \left| \begin{array}{l} 1 \\ -2 \end{array} \right.$$

$$\left\{ \begin{array}{l} x - y = 5 \\ y = -2 \\ z = -1 \end{array} \right| \begin{array}{l} 1 \\ 1 \end{array}$$

$$\left\{ \begin{array}{l} x = 3 \\ y = -2 \\ z = -1 \end{array} \right.$$

$$S = \{(3; -2; -1)\}$$

$$6) \left\{ \begin{array}{l} 3z - 2y - x = 17 \\ 2y + 3z - 2x = 36 \\ 5x + 2y - z = 10 \end{array} \right.$$

$$\left\{ \begin{array}{l} -x - 2y + 3z = 17 \\ -2x + 2y + 3z = 36 \\ 5x + 2y - z = 10 \end{array} \right| \begin{array}{l} -2 \\ 1 \end{array} \left| \begin{array}{l} 5 \\ 1 \end{array} \right.$$

$$\begin{cases} -x - 2y + 3z = 17 \\ 6y - 3z = 2 \\ -8y + 14z = 95 \end{cases} \left| \begin{array}{c} 4 \\ 3 \end{array} \right. \\
\begin{cases} -x - 2y + 3z = 17 \\ 6y - 3z = 2 \\ 30z = 293 \end{cases} \left| \begin{array}{c} -10 \\ 1 \end{array} \right| \begin{array}{c} 10 \\ 1 \end{array} \\
\begin{cases} 10x + 20y = 123 \\ 60y = 313 \\ 30z = 293 \end{cases} \left| \begin{array}{c} 3 \\ -1 \end{array} \right. \\
\begin{cases} 30x = 56 \\ 60y = 313 \\ 30z = 293 \end{cases} \left| \begin{array}{c} \frac{1}{30} \\ \frac{1}{60} \\ \frac{1}{30} \end{array} \right. \\
\begin{cases} x = \frac{28}{15} \\ y = \frac{313}{60} \\ z = \frac{293}{30} \end{cases} \\
S = \left\{ \left(\frac{28}{15}; \frac{313}{60}; \frac{293}{30} \right) \right\}$$

$$\begin{aligned}
7) \quad & \begin{cases} 3x - y + z = 29 \\ x + 3y + 30z = 6 \\ x - y + z = 17 \end{cases} \left| \begin{array}{c} -1 \\ 3 \end{array} \right| \begin{array}{c} 1 \\ -3 \end{array} \\
& \begin{cases} 3x - y + z = 29 \\ 10y + 89z = -11 \\ 2y - 2z = -22 \end{cases} \left| \begin{array}{c} 1 \\ -5 \end{array} \right. \\
& \begin{cases} 3x - y + z = 29 \\ 10y + 89z = -11 \\ 99z = 99 \end{cases} \left| \begin{array}{c} \frac{1}{99} \end{array} \right. \\
& \begin{cases} 3x - y + z = 29 \\ 10y + 89z = -11 \\ z = 1 \end{cases} \left| \begin{array}{c} 1 \\ -1 \end{array} \right| \begin{array}{c} 1 \\ -89 \end{array} \\
& \begin{cases} 3x - y = 28 \\ 10y = -100 \\ z = 1 \end{cases} \left| \begin{array}{c} 10 \\ 1 \end{array} \right. \\
& \begin{cases} 30x = 180 \\ 10y = -100 \\ z = 1 \end{cases} \left| \begin{array}{c} \frac{1}{30} \\ \frac{1}{10} \end{array} \right. \\
& \begin{cases} x = 6 \\ y = -10 \\ z = 1 \end{cases} \\
& S = \{(6; -10; 1)\}
\end{aligned}$$

$$\begin{aligned}
8) \quad & \left\{ \begin{array}{l} 2x + 3y + 4z = 47 \\ 3x + 5y - 4z = 2 \\ 4x + 7y - 2z = 31 \end{array} \right. \left| \begin{array}{l} -3 \\ 2 \end{array} \right. \left| \begin{array}{l} -2 \\ 1 \end{array} \right. \\
& \left\{ \begin{array}{l} 2x + 3y + 4z = 47 \\ y - 20z = -137 \\ y - 10z = -63 \end{array} \right. \left| \begin{array}{l} -1 \\ 1 \end{array} \right. \\
& \left\{ \begin{array}{l} 2x + 3y + 4z = 47 \\ y - 20z = -137 \\ 10z = 74 \end{array} \right. \left| \begin{array}{l} 5 \\ -2 \end{array} \right. \left| \begin{array}{l} 1 \\ -2 \end{array} \right. \\
& \left\{ \begin{array}{l} 10x + 15y = 87 \\ y = 11 \\ 10z = 74 \end{array} \right. \left| \begin{array}{l} 1 \\ -15 \end{array} \right. \\
& \left\{ \begin{array}{l} 10x = -78 \\ y = 11 \\ 10z = 74 \end{array} \right. \left| \begin{array}{l} \frac{1}{10} \\ \frac{1}{10} \end{array} \right. \\
& \left\{ \begin{array}{l} x = -\frac{39}{5} \\ y = 11 \\ z = \frac{37}{5} \end{array} \right. \\
& S = \left\{ \left(-\frac{39}{5}; 11; \frac{37}{5} \right) \right\}
\end{aligned}$$

$$\begin{aligned}
9) \quad & \left\{ \begin{array}{l} 2x - y + 3z = 4 \\ 3x + 4y - z = -5 \\ x + 5y - 4z = -9 \end{array} \right. \left| \begin{array}{l} -3 \\ 2 \end{array} \right. \left| \begin{array}{l} -1 \\ 2 \end{array} \right. \\
& \left\{ \begin{array}{l} 2x - y + 3z = 4 \\ 11y - 11z = -22 \\ 11y - 11z = -22 \end{array} \right. \left| \begin{array}{l} \frac{1}{11} \\ \frac{1}{11} \end{array} \right. \\
& \left\{ \begin{array}{l} 2x - y + 3z = 4 \\ y - z = -2 \\ y - z = -2 \end{array} \right. \left| \begin{array}{l} 1 \\ 1 \end{array} \right. \left| \begin{array}{l} -1 \\ 1 \end{array} \right. \\
& \left\{ \begin{array}{l} 2x + 2z = 2 \\ y - z = -2 \\ 0 = 0 \end{array} \right. \left| \begin{array}{l} \frac{1}{2} \end{array} \right. \\
& \left\{ \begin{array}{l} x + z = 1 \\ y - z = -2 \\ 0 = 0 \end{array} \right.
\end{aligned}$$

La dernière équation $0 = 0$ est vérifiée pour n'importe quelle valeur de la variable z . On dit que la variable z est **libre**.

En posant $z = \alpha$ (où $\alpha \in \mathbb{R}$), on obtient :

$$\begin{cases} x = 1 - \alpha \\ y = \alpha - 2 \\ z = \alpha \end{cases}$$

$$S = \{(1 - \alpha; \alpha - 2; \alpha) : \alpha \in \mathbb{R}\}$$

$$10) \begin{cases} x + 2y + 3z = 9 \\ x - y + 4z = 15 \\ -x + 7y - 6z = -27 \end{cases} \left| \begin{array}{c} 1 \\ -1 \\ 1 \end{array} \right| \begin{array}{c} 1 \\ 1 \\ 1 \end{array}$$

$$\begin{cases} x + 2y + 3z = 9 \\ 3y - z = -6 \\ 9y - 3z = -18 \end{cases} \left| \begin{array}{c} -3 \\ 1 \end{array} \right|$$

$$\begin{cases} x + 2y + 3z = 9 \\ 3y - z = -6 \\ 0 = 0 \end{cases} \left| \begin{array}{c} 3 \\ -2 \end{array} \right|$$

$$\begin{cases} 3x + 11z = 39 \\ 3y - z = -6 \\ 0 = 0 \end{cases} \left| \begin{array}{c} \frac{1}{3} \\ \frac{1}{3} \end{array} \right|$$

$$\begin{cases} x + \frac{11}{3}z = 13 \\ y - \frac{1}{3}z = -2 \\ 0 = 0 \end{cases}$$

La dernière équation $0 = 0$ signifie que la variable z est libre.

En posant $z = \alpha$ (où $\alpha \in \mathbb{R}$), on trouve :

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

On remarque que l'on peut simplifier l'écriture de la solution générale en posant plutôt $z = 3\alpha$ (avec $\alpha \in \mathbb{R}$) :

$$\begin{cases} x = 13 - 11\alpha \\ y = \alpha - 2 \\ z = 3\alpha \end{cases}$$

$$S = \{(13 - 11\alpha; \alpha - 2; 3\alpha) : \alpha \in \mathbb{R}\}$$

$$11) \begin{cases} 2x - 3y + 2z - t = 1 \\ -x + 5y - 3z + 2t = -8 \\ 3x + 2y + 4z - 3t = 15 \\ 5x + 9y + z + 4t = -10 \end{cases} \left| \begin{array}{c} 1 \\ 2 \end{array} \right| \left| \begin{array}{c} -3 \\ 2 \end{array} \right| \left| \begin{array}{c} -5 \\ 2 \end{array} \right|$$

$$\begin{cases} 2x - 3y + 2z - t = 1 \\ 7y - 4z + 3t = -15 \\ 13y + 2z - 3t = 27 \\ 33y - 8z + 13t = -25 \end{cases} \left| \begin{array}{c} -13 \\ 7 \end{array} \right| \left| \begin{array}{c} 33 \\ -7 \end{array} \right|$$

$$\left\{ \begin{array}{rcl} 2x - 3y + 2z - t & = & 1 \\ 7y - 4z + 3t & = & -15 \\ 66z - 60t & = & 384 \\ -76z + 8t & = & -320 \end{array} \right| \begin{array}{l} 38 \\ 33 \end{array}$$

$$\left\{ \begin{array}{rcl} 2x - 3y + 2z - t & = & 1 \\ 7y - 4z + 3t & = & -15 \\ 66z - 60t & = & 384 \\ -2016t & = & 4032 \end{array} \right| -\frac{1}{2016}$$

$$\left\{ \begin{array}{rcl} 2x - 3y + 2z - t & = & 1 \\ 7y - 4z + 3t & = & -15 \\ 66z - 60t & = & 384 \\ t & = & -2 \end{array} \right| \begin{array}{l} 1 \\ 1 \end{array} \left| \begin{array}{l} 1 \\ -3 \end{array} \right| \begin{array}{l} 1 \\ 60 \end{array}$$

$$\left\{ \begin{array}{rcl} 2x - 3y + 2z & = & -1 \\ 7y - 4z & = & -9 \\ 66z & = & 264 \\ t & = & -2 \end{array} \right| \frac{1}{66}$$

$$\left\{ \begin{array}{rcl} 2x - 3y + 2z & = & -1 \\ 7y - 4z & = & -9 \\ z & = & 4 \\ t & = & -2 \end{array} \right| \begin{array}{l} 1 \\ -2 \end{array} \left| \begin{array}{l} 1 \\ 4 \end{array} \right|$$

$$\left\{ \begin{array}{rcl} 2x - 3y & = & -9 \\ 7y & = & 7 \\ z & = & 4 \\ t & = & -2 \end{array} \right| \frac{1}{7}$$

$$\left\{ \begin{array}{rcl} 2x & = & -6 \\ y & = & 1 \\ z & = & 4 \\ t & = & -2 \end{array} \right| \frac{1}{2}$$

$$\left\{ \begin{array}{rcl} x & = & -3 \\ y & = & 1 \\ z & = & 4 \\ t & = & -2 \end{array} \right|$$

$$S = \{(-3; 1; 4; -2)\}$$

$$12) \left\{ \begin{array}{rcl} x + y + z & = & 9 \\ y + z + t & = & 6 \\ x + z + t & = & 7 \\ x + y + t & = & 8 \end{array} \right| \begin{array}{l} 1 \\ -1 \end{array} \left| \begin{array}{l} 1 \\ -1 \end{array} \right|$$

$$\left\{ \begin{array}{rcl} x + y + z & = & 9 \\ y + z + t & = & 6 \\ y - t & = & 2 \\ z - t & = & 1 \end{array} \right| \begin{array}{l} 1 \\ -1 \end{array}$$

$$\left\{ \begin{array}{rcl} x + y + z & = & 9 \\ y + z + t & = & 6 \\ z + 2t & = & 4 \\ z - t & = & 1 \end{array} \right| \begin{array}{c} 1 \\ -1 \end{array}$$

$$\left\{ \begin{array}{rcl} x + y + z & = & 9 \\ y + z + t & = & 6 \\ z + 2t & = & 4 \\ 3t & = & 3 \end{array} \right| \frac{1}{3}$$

$$\left\{ \begin{array}{rcl} x + y + z & = & 9 \\ y + z + t & = & 6 \\ z + 2t & = & 4 \\ t & = & 1 \end{array} \right| \begin{array}{c} 1 \\ -1 \end{array} \left| \begin{array}{c} 1 \\ -2 \end{array} \right.$$

$$\left\{ \begin{array}{rcl} x + y + z & = & 9 \\ y + z & = & 5 \\ z & = & 2 \\ t & = & 1 \end{array} \right| \begin{array}{c} 1 \\ -1 \end{array} \left| \begin{array}{c} 1 \\ -1 \end{array} \right.$$

$$\left\{ \begin{array}{rcl} x + y & = & 7 \\ y & = & 3 \\ z & = & 2 \\ t & = & 1 \end{array} \right| \begin{array}{c} 1 \\ -1 \end{array}$$

$$\left\{ \begin{array}{rcl} x & = & 4 \\ y & = & 3 \\ z & = & 2 \\ t & = & 1 \end{array} \right.$$

$$S = \{(4; 3; 2; 1)\}$$

$$13) \left\{ \begin{array}{rcl} 2x + y - 3z + t + u & = & 4 \\ x - 2y - z + 3t - u & = & 1 \\ 3x - y + 4z - t - 3u & = & -6 \\ x + y + z + t + u & = & 15 \\ 5x - 4y + 3z - 2t + u & = & 3 \end{array} \right| \begin{array}{c} 1 \\ -2 \end{array} \left| \begin{array}{c} 3 \\ -2 \end{array} \right| \begin{array}{c} -1 \\ 2 \end{array} \left| \begin{array}{c} 5 \\ -2 \end{array} \right.$$

$$\left\{ \begin{array}{rcl} 2x + y - 3z + t + u & = & 4 \\ 5y - z - 5t + 3u & = & 2 \\ 5y - 17z + 5t + 9u & = & 24 \\ y + 5z + t + u & = & 26 \\ 13y - 21z + 9t + 3u & = & 14 \end{array} \right| \begin{array}{c} 1 \\ -1 \end{array} \left| \begin{array}{c} -1 \\ 5 \end{array} \right| \begin{array}{c} 13 \\ -5 \end{array}$$

$$\left\{ \begin{array}{rcl} 2x + y - 3z + t + u & = & 4 \\ 5y - z - 5t + 3u & = & 2 \\ 16z - 10t - 6u & = & -22 \\ 26z + 10t + 2u & = & 128 \\ 92z - 110t + 24u & = & -44 \end{array} \right| \begin{array}{c} -13 \\ 8 \end{array} \left| \begin{array}{c} 23 \\ -4 \end{array} \right.$$

$$\left\{ \begin{array}{rcl} 2x + y - 3z + t + u & = & 4 \\ 5y - z - 5t + 3u & = & 2 \\ 16z - 10t - 6u & = & -22 \\ 210t + 94u & = & 1310 \\ 210t - 234u & = & -330 \end{array} \right| \begin{array}{c} 1 \\ -1 \end{array}$$

$$\left\{ \begin{array}{rcl} 2x + y - 3z + t + u & = & 4 \\ 5y - z - 5t + 3u & = & 2 \\ 16z - 10t - 6u & = & -22 \\ 210t + 94u & = & 1310 \\ 328u & = & 1640 \end{array} \right| \frac{1}{328}$$

$$\left\{ \begin{array}{rcl} 2x + y - 3z + t + u & = & 4 \\ 5y - z - 5t + 3u & = & 2 \\ 16z - 10t - 6u & = & -22 \\ 210t + 94u & = & 1310 \\ u & = & 5 \end{array} \right| \begin{array}{c} 1 \\ -1 \end{array} \left| \begin{array}{c} 1 \\ -3 \end{array} \right| \left| \begin{array}{c} 1 \\ 6 \end{array} \right| \left| \begin{array}{c} 1 \\ -94 \end{array} \right|$$

$$\left\{ \begin{array}{rcl} 2x + y - 3z + t & = & -1 \\ 5y - z - 5t & = & -13 \\ 16z - 10t & = & 8 \\ 210t & = & 840 \\ u & = & 5 \end{array} \right| \frac{1}{210}$$

$$\left\{ \begin{array}{rcl} 2x + y - 3z + t & = & -1 \\ 5y - z - 5t & = & -13 \\ 16z - 10t & = & 8 \\ t & = & 4 \\ u & = & 5 \end{array} \right| \begin{array}{c} 1 \\ -1 \end{array} \left| \begin{array}{c} 1 \\ 5 \end{array} \right| \left| \begin{array}{c} 1 \\ 10 \end{array} \right|$$

$$\left\{ \begin{array}{rcl} 2x + y - 3z & = & -5 \\ 5y - z & = & 7 \\ 16z & = & 48 \\ t & = & 4 \\ u & = & 5 \end{array} \right| \frac{1}{16}$$

$$\left\{ \begin{array}{rcl} 2x + y - 3z & = & -5 \\ 5y - z & = & 7 \\ z & = & 3 \\ t & = & 4 \\ u & = & 5 \end{array} \right| \begin{array}{c} 1 \\ 3 \end{array} \left| \begin{array}{c} 1 \\ 1 \end{array} \right|$$

$$\left\{ \begin{array}{rcl} 2x + y & = & 4 \\ 5y & = & 10 \\ z & = & 3 \\ t & = & 4 \\ u & = & 5 \end{array} \right| \frac{1}{5}$$

$$\left\{ \begin{array}{rcl} 2x + y & = & 4 \\ & y & = 2 \\ & & z = 3 \\ & & & t = 4 \\ & & & & u = 5 \end{array} \right| \begin{array}{l} 1 \\ -1 \end{array}$$

$$\left\{ \begin{array}{rcl} 2x & = & 2 \\ & y & = 2 \\ & & z = 3 \\ & & & t = 4 \\ & & & & u = 5 \end{array} \right| \frac{1}{2}$$

$$\left\{ \begin{array}{rcl} x & = & 1 \\ & y & = 2 \\ & & z = 3 \\ & & & t = 4 \\ & & & & u = 5 \end{array} \right.$$

$$S = \{(1; 2; 3; 4; 5)\}$$