

1. Determine if the given ordered triple is a solution of the system.

$$(-1, 3, 2)$$

$$x - 2z = -5$$

$$y - 3z = -3$$

$$2x - z = -4$$

$$\begin{array}{r} -1 - 2(2) \stackrel{?}{=} -5 \\ -5 = -5 \checkmark \\ \hline 3 - 3(2) \stackrel{?}{=} -3 \\ -3 = -3 \checkmark \\ \hline 2(-1) - 2 \stackrel{?}{=} -4 \\ -4 = -4 \checkmark \end{array}$$

Yes, $(-1, 3, 2)$ is a solution.

2. Solve the system. If the system is inconsistent or dependent, state so.

$$\textcircled{1} 2x + y - 2z = -1$$

$$\textcircled{2} 3x - 3y - z = 5$$

$$\textcircled{3} x - 2y + 3z = 6$$

Eliminate z:

$$\textcircled{1} 2x + y - 2z = -1 \longrightarrow 2x + y - 2z = -1$$

$$\textcircled{2} 3x - 3y - z = 5 \xrightarrow{\cdot(-2)} \begin{array}{r} -6x + 6y + 2z = -10 \\ \hline -4x + 7y = -11 \end{array}$$

$$\textcircled{1} 2x + y - 2z = -1 \xrightarrow{\cdot 3} 6x + 3y - 6z = -3$$

$$\textcircled{3} x - 2y + 3z = 6 \xrightarrow{\cdot 2} \begin{array}{r} 2x - 4y + 6z = 12 \\ \hline 8x - y = 9 \end{array}$$

$$-4x + 7y = -11 \longrightarrow -4x + 7y = -11$$

$$8x - y = 9 \xrightarrow{\cdot 7} \begin{array}{r} 56x - 7y = 63 \\ \hline 52x = 52 \\ x = 1 \end{array}$$

Find y:

$$-4(1) + 7y = -11$$

$$-4 + 7y = -11$$

$$7y = -7$$

$$y = -1$$

Find z:

$$2(1) + (-1) - 2z = -1$$

$$-2z = -2$$

$$z = 1$$

$\{(1, -1, 1)\}$

3. Solve the system. If the system is inconsistent or dependent, state so.

- ① $3x + 4y + 5z = 8$
- ② $x - 2y + 3z = -6$
- ③ $2x - 4y + 6z = 8$

Eliminate y:

$$\begin{array}{r} \textcircled{1} \quad 3x + 4y + 5z = 8 \longrightarrow 3x + 4y + 5z = 8 \\ \textcircled{2} \quad x - 2y + 3z = -6 \xrightarrow{\cdot 2} 2x - 4y + 6z = -12 \\ \hline 5x + 11z = -4 \end{array}$$

$$\begin{array}{r} \textcircled{1} \quad 3x + 4y + 5z = 8 \\ \textcircled{3} \quad 2x - 4y + 6z = 8 \\ \hline 5x + 11z = 16 \end{array}$$

$$\begin{array}{r} 5x + 11z = -4 \longrightarrow 5x + 11z = -4 \\ 5x + 11z = 16 \xrightarrow{\cdot (-1)} -5x - 11z = -16 \\ \hline 0 = -20 \leftarrow \text{false!} \end{array}$$

Inconsistent

Solution set: \emptyset

Q: What can't be used until it's broken?