Question

Check whether the following system of equations has a solution

x + y + 3z + w = 5-x + y + z - 5w = 7 x + 2y + 5z - w = 5

Solution

	Solution	
Augmented matrix		
Augmented matrix	г 1 1 О 1	6 3
		5
	$ -1 \ 1 \ 1 \ -5$	7
		<u>_</u>
	L 1 2 5 -1	51
Add row1 to row2 ($R_2 \leftarrow R_2$ -	$+ R_{1}$)	
	$\Gamma^{(1)}_{1}$	г 1
		5
	0 2 4 -4	12
	11 2 5 -1	51
Subtract row1 from row3 (R_2)	$\leftarrow R_2 - R_1$)	
	r1 1 2 1	51
		5
	0 2 4 -4	12
	10 1 2 -2	01
Augmented matrix Add row1 to row2 ($R_2 \leftarrow R_2$ - Subtract row1 from row3 (R_3 Divide row2 by 2 ($R_2 \leftarrow R_2/2$ Subtract row2 from row1 (R_1 Subtract row2 from row3 (R_3 Add row3 to row2 ($R_2 \leftarrow R_2$ - Divide row3 by -6 ($R_3 \leftarrow R_3$	2)	
	Г1 1 3 1	51
	$\begin{bmatrix} 0 & 1 & 2 & -2 \end{bmatrix}$	6
	0 1 2 -2	
Subtract new 2 from new 1 (D		60
Subtract row2 from row1 (R_1	$\leftarrow R_1 - R_2)$	
	$[1 \ 0 \ 1 \ 3]$	-1]
		6
		0
	10 1 2 -2	01
Subtract row2 from row3 ($R_{\rm o}$	$\leftarrow R_{2} - R_{2}$	
	$r_1 0 1 2$	11
		-1
	0 1 2 -2	6
		-61
Add row3 to row2 ($R_2 \leftarrow R_2$ -	$+R_{3}$)	
	r1 0 1 3	_11
	$\begin{bmatrix} 0 & 1 & 2 & -2 \end{bmatrix}$	0
		-6
Divide row 2 by $f(D \neq D)$		61
Divide row3 by $-6 (R_3 \leftarrow R_3)$	/(-0))	
	$\begin{bmatrix} 1 & 0 & 1 & 3 \\ 0 & 1 & 2 & -2 \\ 0 & 0 & 0 & 0 \end{bmatrix}$	-1]
		U I
		1]
Add row3 to row1 ($R_1 \leftarrow R_1$ -	$+R_{2}$)	
	$ \begin{array}{ccccccc} + R_3) \\ \begin{bmatrix} 1 & 0 & 1 & 3 \\ 0 & 1 & 2 & -2 \\ 0 & 0 & 0 & 0 \end{array} $	01
		0
	0 1 2 -2	0
		1
		ΤŢ

$$\begin{cases} x+z-w=0\\ y+2z-2w=0\\ 0=1 \end{cases}$$

The system is inconsistent and has no solution.

Answer: the system has no solution.

Answer provided by https://www.AssignmentExpert.com