1. Să se verifice liniar independența următoarelor sisteme de vectori:

b) $S_2 = \{(1,3,2)^T, (-1,4,1)^T, (3,0,1)^T\}$

$$D = \begin{vmatrix} 1 & -1 & 3 \\ 3 & 4 & 0 \\ 2 & 1 & 1 \end{vmatrix} = 4 + 9 + 0 - 24 - 0 + 3 = -8 \neq 0 \Rightarrow S_2 \text{ l.i.}$$

d) $S_4 = \{(1,5,-1)^T, (4,2,0)^T, (-3,3,-1)^T\}$

$$D = \begin{vmatrix} 1 & 4 & -3 \\ 5 & 2 & 3 \\ -1 & 0 & -1 \end{vmatrix} = -2 + 0 - 12 - 6 - 0 + 20 = 0 \Rightarrow S_4 \text{ l.d;}$$

f) $S_6 = \{(2,2,5)^T, (-1,-1,3)^T\}$

$$A = \begin{pmatrix} 2 & -1 \\ 2 & -1 \\ 5 & 3 \end{pmatrix}; \quad D_T = \begin{vmatrix} 2 & -1 \\ 2 & -1 \end{vmatrix} = 0; \quad D_T = \begin{vmatrix} 2 & -1 \\ 5 & 3 \end{vmatrix} = 6 + 5 = 11 \neq 0 \Rightarrow \text{rang } A = 2$$

$$\text{rang } A = \text{card } S_6 \Rightarrow S_6 \text{ l.i.}$$

2. Să se verifice dacă urm. sisteme sunt sisteme de generatori:

b) $S_2 = \{(1,2,1)^T, (3,1,0)^T, (-1,2,1)^T\}$

$$D = \begin{vmatrix} 1 & 3 & -1 \\ 2 & 1 & 2 \\ 1 & 0 & 1 \end{vmatrix} = 1 - 0 + 6 + 1 - 0 - 6 = 2 \neq 0 \Rightarrow \text{rang } A = 3.$$

$$\text{rang } A = \dim V \Rightarrow S_2 \text{ e sist. de generatori.}$$