

7)

\mathbb{R}^4	$e_1 = (1, 0, 2, 1)$ $e_2 = (2, 1, -1, 0)$ $e_3 = (-1, 0, 1, 0)$ $e_4 = (2, 0, 0, 1)$	$(0, 0, 3, 1)$	$(1, 0, 1, 0)$	$(1, 1, 1, 0)$	$(\frac{1}{3}, \frac{1}{3}, \frac{2}{3}, \frac{1}{3})$
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$$\begin{pmatrix} 1 & 2 & -1 & 2 & | & a \\ 0 & 1 & 0 & 0 & | & b \\ 2 & -1 & 1 & 0 & | & c \\ 1 & 0 & 0 & 1 & | & d \end{pmatrix} \rightsquigarrow \begin{pmatrix} 1 & 2 & -1 & 2 & | & a \\ 0 & 1 & 0 & 0 & | & b \\ 0 & -3 & 3 & -6 & | & c-2b \\ 0 & -2 & 1 & -1 & | & d-a \end{pmatrix} \rightsquigarrow \begin{pmatrix} 1 & 2 & -1 & 2 & | & a \\ 0 & 1 & 0 & 0 & | & b \\ 0 & 0 & 3 & -6 & | & c-2b+3d \\ 0 & 0 & 1 & -1 & | & d-a+2b \end{pmatrix}$$

$$\begin{pmatrix} 1 & 2 & -1 & 2 & | & a \\ 0 & 1 & 0 & 0 & | & b \\ 0 & 0 & 3 & -6 & | & -2a+3b+c \\ 0 & 0 & 0 & -3 & | & a-b+c-2d \end{pmatrix} \begin{pmatrix} 0 \\ 0 \\ 3 \\ 1 \end{pmatrix} \rightsquigarrow \begin{cases} x=1 \\ y=0 \\ 3z=3 & z=1 \\ -3w=3-3 & w=0 \end{cases} \begin{pmatrix} 1 \\ 1 \\ 1 \\ 1 \end{pmatrix} \rightsquigarrow \begin{cases} x=-2+z/3+z/3+1 \\ y=1 & = 1/3 \\ 3z=3-2 & z=2/3 \\ -3w=1 & w=-1/3 \end{cases}$$