En los inciso i), ii), iii) y iv) siguientes
a) determine la matriz de transición de B_1 a B_2.

i)$B_1 = \{(1,3),(-2,-2)\}$, $B_2 = \{(-12,0),(-4,4)\}, [u]_{B_2} = (-1,3)$

Solución:

$$\left[B_1/B_2\right] = \begin{bmatrix} 1 & -2 & | & -12 & -4 \\ 0 & 4 & | & 36 & 16 \end{bmatrix} \left[\tfrac{1}{4}f_2 \to f_2\right] \sim$$

$$\begin{bmatrix} 1 & -2 & | & -12 & -4 \\ 0 & 1 & | & 9 & 4 \end{bmatrix} \left[-2f_2 + F_1 \to f_1\right] \sim \begin{bmatrix} 1 & 0 & | & 6 & 4 \\ 0 & 1 & | & 9 & 4 \end{bmatrix}$$

Por lo tanto

$$\mathrm{P}_{B_2 \to B_1} = \begin{bmatrix} 6 & 4 \\ 9 & 4 \end{bmatrix}$$

ii)$B_1 = \{(2,-2),(6,3)\}$, $B_2 = \{(1,1),(32,31)\}, [u]_{B_2} = (2,-1)$

Solución:

$$\left[B_1/B_2\right] = \begin{bmatrix} 1 & 32 & | & 2 & 6 \\ 1 & 31 & | & -2 & 3 \end{bmatrix} \left[\tfrac{1}{2}f_1 \to f_1\right] \sim \begin{bmatrix} 1 & 3 & | & \frac{1}{2} & 16 \\ -2 & 3 & | & 1 & 31 \end{bmatrix} \left[-2f_1 + f_2 \to f_2\right] \sim$$

$$\begin{bmatrix} 1 & 3 & | & \frac{1}{2} & 16 \\ 0 & 9 & | & 2 & 63 \end{bmatrix} \left[\tfrac{1}{9}f_2 \to f_2\right] \sim \begin{bmatrix} 1 & 3 & | & \frac{1}{2} & 16 \\ 0 & 1 & | & \frac{2}{9} & 7 \end{bmatrix} \left[-3f_2 + f_1 \to f_1\right]$$

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$$\mathrm{P}_{B_2 \to B_1} = \begin{bmatrix} \frac{1}{6} & -5 \\ \frac{2}{9} & 7 \end{bmatrix}$$

iii)$B_1 = \{(4,2,-4),(6,-5,-6),(2,-1,8)\}$, $B_2 = \{(1,0,4),(4,2,8),(2,5,-2)\}, [u]_{B_2} = (1,-1,2)$

Solución:

$$\left[B_1/B_2\right] = \begin{bmatrix} 4 & 6 & 2 & | & 1 & 4 & 2 \\ 2 & -5 & -1 & | & 0 & 2 & 5 \\ -4 & -6 & 8 & | & 4 & 8 & -2 \end{bmatrix} \left[\tfrac{1}{4}f_1 \to f_1\right] \sim$$

$$\begin{bmatrix} 1 & \frac{6}{4} & \frac{1}{2} & | & \frac{1}{4} & 1 & \frac{1}{2} \\ 2 & 5 & -1 & | & 0 & 2 & 5 \\ -4 & -6 & 8 & | & 4 & 8 & -2 \end{bmatrix} \begin{bmatrix} -2f_1 + f_2 \to f_2 \\ -4f_1 + f_3 \to f_3 \end{bmatrix} \sim$$

$$\begin{bmatrix} 1 & \frac{6}{4} & \frac{1}{2} & | & \frac{1}{4} & 1 & \frac{1}{2} \\ 0 & -8 & -2 & | & \frac{1}{2} & 0 & 4 \\ 0 & 0 & 10 & | & 5 & 12 & 0 \end{bmatrix} \begin{bmatrix} -\frac{1}{8}f_2 \to f_2 \\ \frac{1}{10}f_3 \to f_3 \end{bmatrix} \sim$$

$$\begin{bmatrix} 1 & \frac{6}{4} & \frac{1}{2} & | & \frac{1}{4} & 1 & \frac{1}{2} \\ 0 & 1 & \frac{1}{4} & | & -\frac{1}{16} & 0 & -\frac{1}{2} \\ 0 & 0 & 1 & | & \frac{1}{2} & \frac{6}{5} & 0 \end{bmatrix} \begin{bmatrix} -\frac{1}{2}f_3 + f_1 \to f_1 \\ -\frac{1}{4}f_3 + f_2 \to f_2 \end{bmatrix} \sim$$

$$\begin{bmatrix} 1 & \frac{6}{4} & 0 & | & 0 & \frac{2}{5} & -\frac{1}{2} \\ 0 & 1 & 0 & | & -\frac{1}{16} & -\frac{3}{10} & -\frac{1}{2} \\ 0 & 0 & 1 & | & \frac{1}{2} & \frac{6}{5} & 0 \end{bmatrix} \begin{bmatrix} -\frac{6}{4}f_2 + f_1 \to f_1 \end{bmatrix} \sim$$

$$\begin{bmatrix} 1 & 0 & 0 & | & \frac{3}{32} & \frac{17}{20} & \frac{5}{4} \\ 0 & 1 & 0 & | & -\frac{1}{16} & -\frac{3}{10} & -\frac{1}{2} \\ 0 & 0 & 1 & | & \frac{1}{2} & \frac{6}{5} & 0 \end{bmatrix}$$

Por lo tanto

$$\mathrm{P}_{B_2 \to B_1} = \begin{bmatrix} \frac{3}{32} & \frac{17}{20} & \frac{5}{4} \\ -\frac{1}{16} & -\frac{3}{10} & -\frac{1}{2} \\ \frac{1}{2} & \frac{6}{5} & 0 \end{bmatrix}$$

iv)$B_1 = \{(1,3,4),(2,-5,2),(-4,2,-6)\},\ B_2 = \{(1,2,-2),(4,1,-4),(-2,5,8)\}$
Solución:

$$\begin{bmatrix} B_1/B_2 \end{bmatrix} = \begin{bmatrix} 1 & 2 & -4 & | & 1 & 4 & -2 \\ 3 & -5 & 2 & | & 2 & 1 & 5 \\ 4 & 2 & -6 & | & -2 & -4 & 8 \end{bmatrix} \begin{bmatrix} -3f_1 + f_2 \to f_2 \\ -4f_1 + f_3 \to f_3 \end{bmatrix} \sim$$

$$\begin{bmatrix} 1 & 2 & -4 & | & 1 & 4 & -2 \\ 0 & -11 & 14 & | & -1 & -11 & 11 \\ 0 & -6 & 10 & | & -6 & -20 & 16 \end{bmatrix} \begin{bmatrix} -\frac{1}{11}f_2 \to f_2 \end{bmatrix} \sim$$

$$\begin{bmatrix} 1 & 2 & -4 & | & 1 & 4 & -2 \\ 0 & 1 & -\frac{14}{11} & | & \frac{1}{11} & 1 & -1 \\ 0 & -6 & 10 & | & -6 & -20 & 16 \end{bmatrix} \begin{bmatrix} -2f_2 + f_1 \to f_1 \\ 6f_2 + f_3 \to f_3 \end{bmatrix} \sim$$

$$\begin{bmatrix} 1 & 0 & -\frac{16}{11} & | & \frac{9}{11} & 2 & 0 \\ 0 & 1 & -\frac{14}{11} & | & \frac{1}{11} & 1 & -1 \\ 0 & 0 & 1 & | & -\frac{10}{11} & -14 & \frac{1}{0} \end{bmatrix} \begin{bmatrix} \frac{11}{26}f_3 \to f_3 \end{bmatrix} \sim$$

$$\begin{bmatrix} 1 & 0 & -\frac{16}{11} & | & \frac{9}{11} & 2 & 0 \\ 0 & 1 & -\frac{14}{11} & | & \frac{1}{11} & 1 & -1 \\ 0 & 0 & 1 & | & -\frac{30}{13} & -\frac{77}{13} & \frac{55}{13} \end{bmatrix} \begin{bmatrix} \frac{14}{11}f_3 + f_2 \to f_2 \\ \frac{16}{11}f_3 + f_1 \to f_1 \end{bmatrix} \sim$$

$$\begin{bmatrix} 1 & 0 & 1 & | & -\frac{33}{13} & -\frac{86}{13} & \frac{80}{13} \\ 0 & 1 & 0 & | & -\frac{37}{13} & -\frac{85}{13} & \frac{57}{13} \\ 0 & 0 & 1 & | & -\frac{30}{13} & -\frac{77}{13} & \frac{55}{13} \end{bmatrix}$$

Por lo tanto

$$\mathrm{P}_{B_1 \to B_2} = \begin{bmatrix} -\frac{33}{13} & -\frac{86}{13} & \frac{80}{13} \\ -\frac{37}{13} & -\frac{85}{13} & \frac{57}{13} \\ -\frac{30}{13} & -\frac{77}{13} & \frac{55}{13} \end{bmatrix}$$