① $3\begin{pmatrix} -2 & 1 \\ 0 & 4 \\ 2 & 3 \end{pmatrix}$

$3\begin{pmatrix} -2 & 1 \\ 0 & 4 \\ 2 & 3 \end{pmatrix} \rightarrow \begin{bmatrix} -2(3) & 1(3) \\ 0(3) & 4(3) \\ 2(3) & 3(3) \end{bmatrix} \rightarrow \begin{bmatrix} -6 & 3 \\ 0 & 12 \\ 6 & 9 \end{bmatrix}$ ①

② $\begin{bmatrix} 1 & 0 & 3 \\ 2 & -1 & 6 \end{bmatrix} + \begin{bmatrix} 2 & 0 & 4 \\ -2 & 5 & 8 \end{bmatrix}$

$\begin{bmatrix} 1+2 & 0+0 & 3+4 \\ 2-2 & -1+5 & 8+6 \end{bmatrix} \rightarrow \begin{bmatrix} 3 & 0 & 7 \\ 0 & 4 & 14 \end{bmatrix}$ ②

③ $5\begin{bmatrix} 2 & 1 & 3 \\ -1 & 2 & 4 \\ -6 & 1 & 5 \end{bmatrix} - 3\begin{bmatrix} -2 & 1 & 4 \\ 5 & 0 & 7 \\ 2 & -1 & 3 \end{bmatrix}$

$\begin{bmatrix} 5(2) & 5(1) & 5(3) \\ 5(-1) & 5(2) & 5(4) \\ 5(-6) & 5(1) & 5(5) \end{bmatrix} - \begin{bmatrix} 3(-2) & 3(1) & 3(4) \\ 3(5) & 3(0) & 3(7) \\ 3(2) & 3(-1) & 3(3) \end{bmatrix} \rightarrow$

$\begin{bmatrix} 10 & 5 & 15 \\ -5 & 10 & 20 \\ -30 & 5 & 25 \end{bmatrix} - \begin{bmatrix} -6 & 3 & 12 \\ 15 & 0 & 21 \\ 6 & -3 & 9 \end{bmatrix} \rightarrow$

$$\begin{bmatrix} 10-(-6) & 5-3 & 15-12 \\ -5-15 & 10-0 & 20-21 \\ -30-6 & 5-(-3) & 25-9 \end{bmatrix} \rightarrow \begin{bmatrix} 16 & 2 & 3 \\ -20 & 10 & -1 \\ -36 & 8 & 16 \end{bmatrix}$$ (3)

(4)

$$\begin{bmatrix} 2 & 3 \\ -1 & 4 \end{bmatrix} \begin{bmatrix} 5 & -1 \\ 2 & 7 \end{bmatrix}$$

$10 + 6 = 16$

$-2 + 21 = 19$

$-5 + 8 = 3$

$1 + 28 = 29$

(4)

$$\begin{bmatrix} 16 & 19 \\ 3 & 29 \end{bmatrix}$$

(5)

$2 \times 4 \quad 4 \times 3$

$$\begin{bmatrix} 2 & 3 & 1 & 5 \\ 0 & 6 & 2 & 4 \end{bmatrix} \begin{bmatrix} 5 & 7 & 1 \\ 2 & 0 & 3 \\ 1 & 0 & 0 \\ 0 & 5 & 6 \end{bmatrix}$$

$10 + 6 + 1 + 0 = 17$

$14 + 0 + 0 + 25 = 39$

$2 + 9 + 0 + 30 = 41$

$0 + 12 + 2 + 0 = 14$

$0 + 0 + 0 + 20 = 20$

$0 + 18 + 0 + 24 = 42$

(5)

$$\begin{bmatrix} 17 & 39 & 41 \\ 14 & 20 & 42 \end{bmatrix}$$

⑥

$$\begin{bmatrix} 2 & 3 & 5 \\ -1 & 6 & 4 \\ 1 & 0 & 6 \end{bmatrix} \begin{bmatrix} 0 & -1 & 2 \\ 3 & 1 & 2 \\ -7 & 3 & 5 \end{bmatrix}$$

$0+9-35=-26$ $\quad$ $0+0-42=-42$

$-2+3+15=16$ $\quad$ $-1+0+18=17$

$4+6+25=35$ $\quad$ $2+0+30=32$

$0+18-28=-10$

$1+6+12=19$

$-2+12+20=30$

⑥

$$\begin{bmatrix} -26 & 16 & 35 \\ -10 & 19 & 30 \\ -42 & 17 & 32 \end{bmatrix}$$

⑦

$2\times 5 \quad 5\times 2$

$$\begin{bmatrix} 1 & 0 & 3 & -1 & 5 \\ 2 & 1 & 6 & 2 & 5 \end{bmatrix} \begin{bmatrix} 7 & 1 \\ 2 & 3 \\ -1 & 0 \\ 5 & 6 \\ 2 & 3 \end{bmatrix}$$

$7+0-3-5+10=9$

$1+0+0-6+15=10$

$14+2-6+10+10=30$

$2+3+0+12+15=32$

⑦

$$\begin{bmatrix} 9 & 10 \\ 30 & 32 \end{bmatrix}$$

(8)

$$\begin{bmatrix} 1 & -1 & 2 \\ 3 & 5 & 6 \\ 2 & 4 & -1 \end{bmatrix} \begin{bmatrix} 2 \\ 1 \\ 3 \end{bmatrix}$$

$3 \times 3 \quad 3 \times 1$

$2 - 1 + 6 = 7$

$6 + 5 + 18 = 29$

$4 + 4 - 3 = 5$

(8)

$$\begin{bmatrix} 7 \\ 29 \\ 5 \end{bmatrix}$$

$$A=\begin{bmatrix}3&0\\-1&2\\1&1\end{bmatrix} \quad B=\begin{bmatrix}4&-1\\0&2\end{bmatrix} \quad C=\begin{bmatrix}1&4&2\\3&9&5\end{bmatrix}$$

$$D=\begin{bmatrix}1&5&2\\-1&0&1\\3&2&4\end{bmatrix} \quad E=\begin{bmatrix}6&1&3\\-1&1&2\\4&1&3\end{bmatrix}$$

(9) AB 3×2 2×2

$$\begin{bmatrix}\boxed{3&0}\\-1&2\\1&1\end{bmatrix}\begin{bmatrix}\boxed{4}&-1\\\boxed{0}&2\end{bmatrix}$$

$12+0=12$ $\quad 4+0=4$

$-3+0=-3$ $\quad -1+2=1$

$-4+0=-4$

$1+4=5$

(9)

$$\begin{bmatrix}12&-3\\-4&5\\4&1\end{bmatrix}$$

(10) $D+E$

$$\begin{bmatrix}1&5&2\\-1&0&1\\3&2&4\end{bmatrix}+\begin{bmatrix}6&1&3\\-1&1&2\\4&1&3\end{bmatrix}\longrightarrow\begin{bmatrix}1+6&5+1&3+2\\-1-1&0+1&1+2\\3+4&2+1&4+3\end{bmatrix}$$

$$\begin{bmatrix}7&6&5\\-2&1&3\\7&3&7\end{bmatrix}$$ (10)

(11) D - E

$$\begin{bmatrix} 1 & 5 & 2 \\ -1 & 0 & 1 \\ 3 & 2 & 4 \end{bmatrix} - \begin{bmatrix} 6 & 1 & 3 \\ -1 & 1 & 2 \\ 4 & 1 & 3 \end{bmatrix} \rightarrow \begin{bmatrix} 1-6 & 5-1 & 2-3 \\ -1-(-1) & 0-1 & 1-2 \\ 3-4 & 2-1 & 4-3 \end{bmatrix}$$

(11)

$$\begin{bmatrix} -5 & 4 & -1 \\ 0 & -1 & -1 \\ -1 & 1 & 1 \end{bmatrix}$$

(12) DE

$$\begin{bmatrix} 1 & 5 & 2 \\ -1 & 0 & 1 \\ 3 & 2 & 4 \end{bmatrix} \begin{bmatrix} 6 & 1 & 3 \\ -1 & 1 & 2 \\ 4 & 1 & 3 \end{bmatrix}$$

$6 - 5 + 8 = 9$

$1 + 5 + 2 = 8$

$3 + 10 + 6 = 19$

$-6 + 0 + 4 = -2$

$-1 + 0 + 1 = 0$

$-3 + 0 + 3 = 0$

$18 - 2 + 16 = 32$

$3 + 2 + 4 = 9$

$9 + 4 + 12 = 25$

(12)

$$\begin{bmatrix} 9 & 8 & 19 \\ -2 & 0 & 0 \\ 32 & 9 & 25 \end{bmatrix}$$

(13) ED

$$\begin{bmatrix} 6 & 1 & 3 \\ -1 & 1 & 2 \\ 4 & 1 & 3 \end{bmatrix} \begin{bmatrix} 1 & 5 & 2 \\ -1 & 0 & 1 \\ 3 & 2 & 4 \end{bmatrix}$$

$6-1+9=14$ $\quad -5+0+4=-1$ $\quad 8+1+12=21$

$30+0+6=36$ $\quad -2+1+8=7$

$12+1+12=25$ $\quad 4-1+9=12$

$-1-1+6=4$ $\quad 20+0+6=26$

(13)

$$\begin{bmatrix} 14 & 36 & 25 \\ 4 & -1 & 7 \\ 12 & 26 & 21 \end{bmatrix}$$

(14) $-7B$

$$-7\begin{bmatrix} 4 & -1 \\ 0 & 2 \end{bmatrix} \rightarrow \begin{bmatrix} 4(-7) & -1(-7) \\ 0(-7) & 2(-7) \end{bmatrix} \rightarrow$$

$$\begin{bmatrix} -28 & 7 \\ 0 & -14 \end{bmatrix}$$ (14)

(15) $3C - D$

$$3\begin{bmatrix} 1 & 4 & 2 \\ 3 & 1 & 5 \end{bmatrix} - \begin{bmatrix} 1 & 5 & 2 \\ -1 & 0 & 1 \\ 3 & 2 & 4 \end{bmatrix}$$

$$\begin{bmatrix} 3(1) & 3(4) & 3(2) \\ 3(3) & 3(1) & 3(5) \end{bmatrix} - \begin{bmatrix} 1 & 5 & 2 \\ -1 & 0 & 1 \\ 3 & 2 & 4 \end{bmatrix} \rightarrow \begin{bmatrix} 3 & 12 & 6 \\ 9 & 3 & 15 \end{bmatrix}$$

$$\begin{bmatrix} 3 & 12 & 6 \\ 9 & 3 & 15 \end{bmatrix} - \begin{bmatrix} 1 & 5 & 2 \\ -1 & 0 & 1 \\ 3 & 2 & 4 \end{bmatrix}$$

No se puede por las dimensiones son diferentes

(15)

(16) $3E(D)$

$$3\begin{bmatrix} 6 & 1 & 3 \\ -1 & 1 & 2 \\ 4 & 1 & 3 \end{bmatrix} \begin{bmatrix} 1 & 5 & 2 \\ -1 & 0 & 1 \\ 3 & 2 & 4 \end{bmatrix} \rightarrow \begin{bmatrix} 3(6) & 3(1) & 3(3) \\ 3(-1) & 3(1) & 3(2) \\ 3(4) & 3(1) & 3(3) \end{bmatrix}$$

$$\begin{bmatrix} 18 & 3 & 9 \\ -3 & 3 & 6 \\ 12 & 3 & 9 \end{bmatrix} \begin{bmatrix} 1 & 5 & 2 \\ -1 & 0 & 1 \\ 3 & 2 & 4 \end{bmatrix}$$

$12 - 3 + 27 = 36$
$60 + 0 + 18 = 78$
$24 + 3 + 36 = 63$

$18 - 3 + 27 = 42$ $\quad -3 - 3 + 18 = 12$
$90 + 0 + 18 = 108$ $\quad -15 + 0 + 12 = -3$
$36 + 3 + 36 = 75$ $\quad -6 + 3 + 24 = 21$

(16)

$$\begin{bmatrix} 42 & 108 & 75 \\ 12 & -3 & 21 \\ 36 & 78 & 63 \end{bmatrix}$$

(17) (A B) C

$$A = \left(\begin{bmatrix} 3 & 0 \\ -1 & 2 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} 4 & -1 \\ 0 & 2 \end{bmatrix} \right) \begin{bmatrix} 1 & 4 & 2 \\ 3 & 1 & 5 \end{bmatrix}$$

$12+0=12$
$-3+0=-3$
$-4+0=-4$
$1+4=5$
$4+0=4$
$-1+2=1$

$$\begin{bmatrix} 12 & -3 \\ -4 & 5 \\ 4 & 1 \end{bmatrix} \begin{bmatrix} 1 & 4 & 2 \\ 3 & 1 & 5 \end{bmatrix}$$

$12-9=3 \quad -4+15=11 \quad 4+3=7$
$48-3=45 \quad -16+5=-11 \quad 16+1=17$
$24-15=9 \quad -8+25=+17 \quad 8+5=13$

(17)

$$\begin{bmatrix} 3 & 45 & 9 \\ 11 & -11 & 17 \\ 7 & 17 & 13 \end{bmatrix}$$

(18) A (B C)

$$\begin{bmatrix} 3 & 0 \\ -1 & 2 \\ 1 & 1 \end{bmatrix} \left(\begin{bmatrix} 4 & -1 \\ 0 & 2 \end{bmatrix} \begin{bmatrix} 1 & 4 & 2 \\ 3 & 1 & 5 \end{bmatrix} \right)$$

$4-3=1$
$16-1=15$
$8-5=3$
$0+6=6$
$0+2=2$
$0+10=10$

$$\begin{bmatrix} 3 & 0 \\ -1 & 2 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} 1 & 15 & 3 \\ 6 & 2 & 10 \end{bmatrix}$$

$3+0=3$
$45+0=45$
$9+0=9$
$-1+12=11$
$-15+4=-11$
$-3+20=17$
$1+6=7$

$15+2=17$
$3+10=13$

(18)

$$\begin{bmatrix} 3 & 45 & 9 \\ 11 & -11 & 17 \\ 7 & 17 & 13 \end{bmatrix}$$

(20) $D + E^2$

$$20 = \begin{bmatrix} 1 & 5 & 2 \\ -1 & 0 & 1 \\ 3 & 2 & 4 \end{bmatrix} + \begin{bmatrix} 6 & 1 & 3 \\ -1 & 1 & 2 \\ 4 & 1 & 3 \end{bmatrix} \begin{bmatrix} 6 & 1 & 3 \\ -1 & 1 & 2 \\ 4 & 1 & 3 \end{bmatrix}$$

$36 - 1 + 12 = 47$
$6 + 1 + 3 = 10$
$18 + 2 + 9 = 29$
$-6 - 1 + 8 = 1$
$-1 + 1 + 2 = 2$
$-3 + 2 + 6 = 5$
$24 - 1 + 12 = 35$
$4 + 1 + 3 = 8$
$12 + 2 + 9 = 23$

$$\begin{bmatrix} 1 & 5 & 2 \\ -1 & 0 & 1 \\ 3 & 2 & 4 \end{bmatrix} + \begin{bmatrix} 47 & 10 & 29 \\ 1 & 2 & 5 \\ 35 & 8 & 23 \end{bmatrix}$$

$$\begin{bmatrix} 1+47 & 10+5 & 2+29 \\ -1+1 & 0+2 & 5+1 \\ 35+3 & 8+2 & 23+4 \end{bmatrix}$$

(20)

$$\begin{bmatrix} 48 & 15 & 31 \\ 0 & 2 & 6 \\ 38 & 10 & 27 \end{bmatrix}$$

(21) $\begin{bmatrix} 1 & 2 \\ 3 & 5 \end{bmatrix} \rightarrow \left[\begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ 3 & 5 & 0 & 1 \end{array}\right] \xrightarrow{e_1 - 3e_1 \rightarrow e_2}$

$\left[\begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ 0 & -1 & -3 & 1 \end{array}\right] \xrightarrow[\rightarrow e_2]{e_2(-1)} \left[\begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ 0 & 1 & 3 & -1 \end{array}\right] \xrightarrow{e_1 - 2e_2 \rightarrow e_1}$

$\left[\begin{array}{cc|cc} 1 & 0 & -5 & 2 \\ 0 & 1 & 3 & -1 \end{array}\right] \rightarrow \begin{bmatrix} -5 & 2 \\ 3 & -1 \end{bmatrix}$ Inversa (21)

(22) $\begin{bmatrix} -2 & 3 \\ 3 & -5 \end{bmatrix} \rightarrow \left[\begin{array}{cc|cc} -2 & 3 & 1 & 0 \\ 3 & -5 & 0 & 1 \end{array}\right] \xrightarrow{2e_2 + 3e_1 \rightarrow e_2}$

$\left[\begin{array}{cc|cc} -2 & 3 & 1 & 0 \\ 0 & -1 & 3 & 2 \end{array}\right] \xrightarrow{e_2(-1) \rightarrow e_2} \left[\begin{array}{cc|cc} -2 & 3 & 1 & 0 \\ 0 & 1 & -3 & -2 \end{array}\right] \xrightarrow{e_1 - 3e_2 \rightarrow e_1}$

$\left[\begin{array}{cc|cc} -2 & 0 & 10 & 6 \\ 0 & 1 & -3 & -2 \end{array}\right] \xrightarrow{e_1/2 \rightarrow e_1} \left[\begin{array}{cc|cc} 1 & 0 & -5 & -3 \\ 0 & 1 & -3 & -2 \end{array}\right]$

$\rightarrow \begin{bmatrix} -5 & -3 \\ -3 & -2 \end{bmatrix}$ (22)

(26) $\begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix} \longrightarrow \left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 1 \end{array}\right]$

$e_3 - e_1 \to e_3 \longrightarrow \left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 0 & 1 & -1 & -1 & 0 & 1 \end{array}\right] \quad e_3 - e_2 \to e_3 \longrightarrow$

$\left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & -2 & -1 & -1 & 1 \end{array}\right] \quad e_3 / -2 \to e_3 \longrightarrow \left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & \frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \end{array}\right]$

$e_2 - e_3 \to e_2 \longrightarrow \left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & -\frac{1}{2} & \frac{1}{2} & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \end{array}\right] \quad e_1 - e_3 \to e_3 \longrightarrow$

$\left[\begin{array}{ccc|ccc} 1 & 0 & 0 & \frac{1}{2} & -\frac{1}{2} & \frac{1}{2} \\ 0 & 1 & 0 & -\frac{1}{2} & \frac{1}{2} & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \end{array}\right]$

(26)

$$\begin{bmatrix} \frac{1}{2} & -\frac{1}{2} & \frac{1}{2} \\ -\frac{1}{2} & \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \end{bmatrix}$$

(27)

$$\begin{bmatrix} 2 & 6 & 6 \\ 2 & 7 & 6 \\ 2 & 7 & 7 \end{bmatrix} \longrightarrow \left[\begin{array}{ccc|ccc} 2 & 6 & 6 & 1 & 0 & 0 \\ 2 & 7 & 6 & 0 & 1 & 0 \\ 2 & 7 & 7 & 0 & 0 & 1 \end{array}\right]$$

$$\begin{matrix} e_2 - e_1 \to e_2 \\ \longrightarrow \\ e_3 - e_1 \to e_3 \end{matrix} \left[\begin{array}{ccc|ccc} 2 & 6 & 6 & 1 & 0 & 0 \\ 0 & 1 & 0 & -1 & 1 & 0 \\ 0 & -1 & -1 & 1 & 0 & -1 \end{array}\right] \xrightarrow{e_3 + e_2 \to e_3}$$

$$\left[\begin{array}{ccc|ccc} 2 & 6 & 6 & 1 & 0 & 0 \\ 0 & 1 & 0 & -1 & 1 & 0 \\ 0 & 0 & -1 & 0 & 1 & -1 \end{array}\right] \xrightarrow{e_3(-1)} \left[\begin{array}{ccc|ccc} 2 & 6 & 6 & 1 & 0 & 0 \\ 0 & 1 & 0 & -1 & 1 & 0 \\ 0 & 0 & 1 & 0 & -1 & 1 \end{array}\right]$$

$$\begin{matrix} e_1 - 6e_3 \to e_1 \\ \longrightarrow \end{matrix} \left[\begin{array}{ccc|ccc} 2 & 6 & 0 & 1 & 6 & -6 \\ 0 & 1 & 0 & -1 & 1 & 0 \\ 0 & 0 & 1 & 0 & -1 & 1 \end{array}\right] \xrightarrow{e_1 - 6e_2}$$

$$\left[\begin{array}{ccc|ccc} 2 & 0 & 0 & 7 & 0 & -6 \\ 0 & 1 & 0 & -1 & 1 & 0 \\ 0 & 0 & 1 & 0 & -1 & 1 \end{array}\right] \xrightarrow{e_1/2 \to e_1}$$

$$\left[\begin{array}{ccc|ccc} 1 & 0 & 0 & \frac{7}{2} & 0 & -3 \\ 0 & 1 & 0 & -1 & 1 & 0 \\ 0 & 0 & 1 & 0 & -1 & 1 \end{array}\right]$$

(27)

$$\begin{bmatrix} \frac{7}{2} & 0 & -3 \\ -1 & 1 & 0 \\ 0 & -1 & 1 \end{bmatrix}$$

(28)

$$\begin{bmatrix} 1 & 0 & 1 \\ -1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix} \longrightarrow \left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ -1 & 1 & 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 \end{array}\right]$$

$e_2 + e_1 \to e_2$

$$\left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 \end{array}\right] \quad e_3 - e_2 \to e_2$$

$$\left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 1 & 0 \\ 0 & 0 & -2 & -1 & -1 & 1 \end{array}\right] \quad e_3 / -2$$

$$\left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 1 & 0 \\ 0 & 0 & 1 & \frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \end{array}\right]$$

$e_2 - 2e_3$

$$\left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & \frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \end{array}\right] \quad e_1 - e_3 \to e_1$$

$$\left[\begin{array}{ccc|ccc} 1 & 0 & 0 & \frac{1}{2} & -\frac{1}{2} & \frac{1}{2} \\ 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & \frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \end{array}\right]$$

(28)

$$\begin{bmatrix} \frac{1}{2} & -\frac{1}{2} & \frac{1}{2} \\ 0 & 0 & 1 \\ \frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \end{bmatrix}$$

(29)

$$\begin{bmatrix} \frac{1}{5} & \frac{1}{5} & \frac{1}{5} \\ \frac{1}{5} & \frac{1}{5} & -\frac{4}{5} \\ -\frac{2}{5} & \frac{1}{10} & \frac{1}{10} \end{bmatrix} \rightarrow \left[\begin{array}{ccc|ccc} \frac{1}{5} & \frac{1}{5} & \frac{1}{5} & 1 & 0 & 0 \\ \frac{1}{5} & \frac{1}{5} & -\frac{4}{5} & 0 & 1 & 0 \\ -\frac{2}{5} & \frac{1}{10} & \frac{1}{10} & 0 & 0 & 1 \end{array}\right]$$

$e_2 - e_1 \to e_2$

$\longrightarrow$

$e_3 + 2e_1 \to e_2$

$$\left[\begin{array}{ccc|ccc} \frac{1}{5} & \frac{1}{5} & \frac{1}{5} & 1 & 0 & 0 \\ 0 & 0 & -1 & -1 & 1 & 0 \\ 0 & \frac{1}{2} & \frac{1}{2} & 2 & 0 & 1 \end{array}\right]$$

Cambiamos fila 2 por fila 3 $\longrightarrow$

$e_2(-1) \to e_2$

$e_3(2) \to e_3$

$$\left[\begin{array}{ccc|ccc} \frac{1}{5} & \frac{1}{5} & \frac{1}{5} & 1 & 0 & 0 \\ 0 & 1 & 1 & 4 & 0 & 2 \\ 0 & 0 & 1 & 1 & -1 & 0 \end{array}\right]$$

$e_2 - e_3 \to e_2$

$\longrightarrow$

$e_1(5) \to e_1$

$$\left[\begin{array}{ccc|ccc} 1 & 1 & 1 & 5 & 0 & 0 \\ 0 & 1 & 0 & 3 & 1 & 2 \\ 0 & 0 & 1 & 1 & -1 & 0 \end{array}\right]$$

$e_1 - e_2 \to e_1$

$\longrightarrow$

$e_2 - e_3 \to e_1$

(29)

$$\left[\begin{array}{ccc|ccc} 1 & 0 & 0 & 1 & 0 & -2 \\ 0 & 1 & 0 & 3 & 1 & 2 \\ 0 & 0 & 1 & 1 & -1 & 0 \end{array}\right]$$

$$\begin{bmatrix} 1 & 0 & -2 \\ 3 & 1 & 2 \\ 1 & -1 & 0 \end{bmatrix}$$

(31)

$$\left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 1 & 2 & 0 & 0 \\ 1 & 2 & 4 & 0 \\ 1 & 2 & 4 & 8 \end{array}\right] \longrightarrow \left[\begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 1 & 2 & 0 & 0 & 0 & 1 & 0 & 0 \\ 1 & 2 & 4 & 0 & 0 & 0 & 1 & 0 \\ 1 & 2 & 4 & 8 & 0 & 0 & 0 & 1 \end{array}\right]$$

$e_2 - e_1 \to e_2$

$$\left[\begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 & -1 & 1 & 0 & 0 \\ 1 & 2 & 4 & 0 & 0 & 0 & 1 & 0 \\ 1 & 2 & 4 & 8 & 0 & 0 & 0 & 1 \end{array}\right]$$

$e_3 - e_1 \to e_3$

$e_3 - e_2 \to e_3$

$$\left[\begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 & -1 & 1 & 0 & 0 \\ 0 & 0 & 4 & 0 & 0 & -1 & 1 & 0 \\ 1 & 2 & 4 & 8 & 0 & 0 & 0 & 1 \end{array}\right]$$

$e_4 - e_1 \to e_4$

$e_4 - e_2 \to e_4$

$e_4 - e_3 \to e_4$

$$\left[\begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 & -1 & 1 & 0 & 0 \\ 0 & 0 & 4 & 0 & 0 & -1 & 1 & 0 \\ 0 & 0 & 0 & 8 & 0 & 0 & -1 & 1 \end{array}\right]$$

$e_2/2 \to e_2$

$e_3/4 \to e_3$

$e_4/8 \to e_4$

$$\left[\begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & -1/2 & 1/2 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & -1/4 & 1/4 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & -1/8 & 1/8 \end{array}\right]$$

(31)

$$\left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ -1/2 & 1/2 & 0 & 0 \\ 0 & -1/4 & 1/4 & 0 \\ 0 & 0 & -1/8 & 1/8 \end{array}\right]$$

(32)

$$\begin{bmatrix} 5 & 11 & 7 & 3 \\ 2 & 1 & 4 & -5 \\ 3 & -2 & 8 & 7 \\ 0 & 0 & 0 & 0 \end{bmatrix} \rightarrow \left[\begin{array}{cccc|cccc} 5 & 11 & 7 & 3 & 1 & 0 & 0 & 0 \\ 2 & 1 & 4 & -5 & 0 & 1 & 0 & 0 \\ 3 & -2 & 8 & 7 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{array}\right]$$

No existe, la mitad de la izquierda no se puede transforma en la matriz inversa (32)