$$\begin{vmatrix} 4 & 7 \\ 1 & 3 \end{vmatrix} = 12-7=5$$

Tarea 6.

46.- a) $\left(\begin{array}{cc|cc} 4 & 7 & 1 & 0 \\ 1 & 3 & 0 & 1 \end{array}\right)$ $R_1 \leftrightarrow R_2$ $\left(\begin{array}{cc|cc} 1 & 3 & 0 & 1 \\ 4 & 7 & 1 & 0 \end{array}\right)$

R_2-4R_1 $\left(\begin{array}{cc|cc} 1 & 3 & 0 & 1 \\ 0 & -5 & 1 & -4 \end{array}\right)$ $R_2 \cdot -1/5$ $\left(\begin{array}{cc|cc} 1 & 3 & 0 & 1 \\ 0 & 1 & -1/5 & 4/5 \end{array}\right)$ R_1-3R_2 $\left(\begin{array}{cc|cc} 1 & 0 & 3/5 & -7/5 \\ 0 & 1 & -1/5 & 4/5 \end{array}\right)$

$A^{-1} = \begin{pmatrix} 3/5 & -7/5 \\ -1/5 & 4/5 \end{pmatrix}$

b) $\left(\begin{array}{cc|cc} -3 & 1 & 1 & 0 \\ 6 & -1 & 0 & 1 \end{array}\right)$ $\begin{vmatrix} -3 & 1 \\ 6 & -1 \end{vmatrix} = 3-6=-3$

$R_1 \cdot -1/3$ $\left(\begin{array}{cc|cc} 1 & -1/3 & -1/3 & 0 \\ 6 & -1 & 0 & 1 \end{array}\right)$ R_2-6R_1 $\left(\begin{array}{cc|cc} 1 & -1/3 & -1/3 & 0 \\ 0 & 1 & 2 & 1 \end{array}\right)$

$R_1+1/3R_2$ $\left(\begin{array}{cc|cc} 1 & 0 & 1/3 & 1/3 \\ 0 & 1 & 2 & 1 \end{array}\right)$ $A^{-1} = \begin{pmatrix} 1/3 & 1/3 \\ 2 & 1 \end{pmatrix}$

c) $A = \begin{pmatrix} 6 & 4 \\ 3 & 2 \end{pmatrix}$

$\begin{vmatrix} 6 & 4 \\ 3 & 2 \end{vmatrix} = 12-12 = \varnothing$ $\det A = 0 \longrightarrow \therefore$ No tiene matriz inversa.

d) $\begin{pmatrix} 7 & 2 \\ 3 & 1 \end{pmatrix}$

$\begin{vmatrix} 7 & 2 \\ 3 & 1 \end{vmatrix} = 7-6=1$

$\left|\begin{array}{cc|cc} 7 & 2 & 1 & 0 \\ 3 & 1 & 0 & 1 \end{array}\right|$ $R_1 \cdot 1/7$ $\left(\begin{array}{cc|cc} 1 & 2/7 & 1/7 & 0 \\ 3 & 1 & 0 & 1 \end{array}\right)$ R_2-3R_1 $\left(\begin{array}{cc|cc} 1 & 2/7 & 1/7 & 0 \\ 0 & 1/7 & -3/7 & 1 \end{array}\right)$

$\left(\begin{array}{cc|cc} 1 & 2/7 & 1/7 & 0 \\ 0 & 1 & -3 & 7 \end{array}\right)$ $R_1-2/7R_2$ $\left(\begin{array}{cc|cc} 1 & 0 & 1 & -2 \\ 0 & 1 & -3 & 7 \end{array}\right)$ $A^{-1} = \begin{pmatrix} 1 & -2 \\ -3 & 7 \end{pmatrix}$

e) $\begin{pmatrix} 2 & 4 & -7 \\ 0 & 1 & 3 \\ 0 & 0 & 9 \end{pmatrix} \rightarrow \begin{vmatrix} 2 & 4 & -7 & 2 & 4 \\ 0 & 1 & 3 & 0 & 1 \\ 0 & 0 & 9 & 0 & 0 \end{vmatrix}$

$= 2(1)(9) + 4(3)(0) - 7(0)(0) - 4(0)(9) - 2(3)(0) + 7(1)(0)$

$= 18 + 0 - 0 - 0 - 0 + 0 = 18$

$\left(\begin{array}{ccc|ccc} 2 & 4 & 7 & 1 & 0 & 0 \\ 0 & 1 & 3 & 0 & 1 & 0 \\ 0 & 0 & 9 & 0 & 0 & 1 \end{array}\right) \begin{array}{c} R_1 \cdot 1/2 \\ \\ R_3 \cdot 1/9 \end{array} \left(\begin{array}{ccc|ccc} 1 & 2 & 7/2 & 1/2 & 0 & 0 \\ 0 & 1 & 3 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1/9 \end{array}\right)$

$\begin{array}{c} R_1 - 7/2 R_3 \\ R_2 - 3R_3 \end{array} \left(\begin{array}{ccc|ccc} 1 & 2 & 0 & 1/2 & 0 & -7/18 \\ 0 & 1 & 0 & 0 & 1 & -1/3 \\ 0 & 0 & 1 & 0 & 0 & 1/9 \end{array}\right) \quad R_1 - 2R_2 \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 1/2 & -2 & 5/18 \\ 0 & 1 & 0 & 0 & 1 & -1/3 \\ 0 & 0 & 1 & 0 & 0 & 1/9 \end{array}\right)$

$A^{-1} = \begin{pmatrix} 1/2 & -2 & 5/18 \\ 0 & 1 & -1/3 \\ 0 & 0 & 1/9 \end{pmatrix}$

f) $\begin{pmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 7 & 3 & -1 \end{pmatrix} \rightarrow \begin{vmatrix} 1 & 2 & 3 & 1 & 2 \\ 2 & 4 & 6 & 2 & 4 \\ 7 & 3 & -1 & 7 & 3 \end{vmatrix}$

$= 1(4)(-1) + 2(6)(7) + 3(2)(3) - 2(2)(-1) - 1(6)(3) - 3(4)(7)$

$= -4 + 84 + 18 + 4 - 18 - 84 = 0$

$\det A = 0 \longrightarrow \therefore$ No tiene matriz inversa

g) $A = \begin{pmatrix} 1 & -2 & 3 \\ 4 & -3 & 2 \\ 1 & -1 & 1 \end{pmatrix} \rightarrow \begin{vmatrix} 1 & -2 & 3 & 1 & -2 \\ 4 & -3 & 2 & 4 & -3 \\ 1 & -1 & 1 & 1 & -1 \end{vmatrix}$

$= 1(-3)(1) - 2(2)(1) + 3(4)(-1) + 2(4)(1) - 1(2)(-1) - 3(-3)(1)$

$= -3 - 4 - 12 + 8 + 2 + 9 = 0$

$\det A = 0 \rightarrow \therefore$ No tiene matriz inversa

47.- a) $\begin{pmatrix} 1 & 4 \\ 3 & 2 \end{pmatrix}$ $\begin{vmatrix} 1 & 4 \\ 3 & 2 \end{vmatrix} = 2 - 12 = -10$

$Adj(B) =$

$B_{12} = (-1)^3\, 3 = -3 \quad B_{11} = (-1)^2\, 2 = 2 \quad B_{21} = (-1)^3 (4) = -4$

$B_{22} = (-1)^4\, 1 = 1$

$CofB = \begin{pmatrix} 2 & -3 \\ -4 & 1 \end{pmatrix} \rightarrow CofB^T = \begin{pmatrix} 2 & -4 \\ -3 & 1 \end{pmatrix}$

$= \frac{1}{-10} \begin{pmatrix} 2 & -4 \\ -3 & 1 \end{pmatrix} = \begin{pmatrix} 2/-10 & -4/-10 \\ -3/-10 & 1/-10 \end{pmatrix} = \begin{pmatrix} -1/5 & 2/5 \\ 3/10 & -1/10 \end{pmatrix}$

b) $\begin{pmatrix} 1 & 2 & 3 \\ 0 & 1 & 2 \\ 4 & 5 & 3 \end{pmatrix}$

$B_{11} = (-1)^2 \begin{vmatrix} 1 & 2 \\ 5 & 3 \end{vmatrix} = 3 - 10 = -7 \quad , \quad B_{12} = (-1)^3 \begin{vmatrix} 0 & 2 \\ 4 & 3 \end{vmatrix} = 0 - 8 = 8$

$B_{13} = (-1)^4 \begin{vmatrix} 0 & 1 \\ 4 & 5 \end{vmatrix} = 0 - 4 = -4 \quad , \quad B_{21} = (-1)^3 \begin{vmatrix} 2 & 3 \\ 5 & 3 \end{vmatrix} = 6 - 15 = 9$

$B_{22} = (-1)^4 \begin{vmatrix} 1 & 3 \\ 4 & 3 \end{vmatrix} = 3 - 12 = -9 \quad , \quad B_{23} = (-1)^5 \begin{vmatrix} 1 & 2 \\ 4 & 5 \end{vmatrix} = 5 - 8 = 3$

$B_{31} = (-1)^4 \begin{vmatrix} 2 & 3 \\ 1 & 2 \end{vmatrix} = 4 - 3 = 1 \quad , \quad B_{32} = (-1)^5 \begin{vmatrix} 1 & 3 \\ 0 & 2 \end{vmatrix} = 2 - 0 = -2$

$B_{33} = (-1)^6 \begin{vmatrix} 1 & 2 \\ 0 & 1 \end{vmatrix} = 1 - 0 = 1$

$Cof(B) \begin{pmatrix} -7 & 8 & -4 \\ 9 & -9 & 3 \\ 1 & -2 & 1 \end{pmatrix}$

$Adj(B) = \begin{pmatrix} -7 & 9 & 1 \\ 8 & -9 & -2 \\ -4 & 3 & 1 \end{pmatrix}$ $\begin{pmatrix} 1 & 2 & 3 \\ 0 & 1 & 2 \\ 4 & 5 & 3 \end{pmatrix} \begin{pmatrix} -7 & 9 & 1 \\ 8 & -9 & -2 \\ -4 & 3 & 1 \end{pmatrix}$

$1(-7)+2(8)+3(-4) \quad 1(9)+2(-9)+3(3) \quad 1(1)+2(-2)+3(1)$

$0(-7)+1(8)+2(-4) \quad 0(9)+1(-9)+2(3) \quad 0(1)+1(-2)+2(1)$

$4(-7)+5(8)+3(-4) \quad 4(9)+5(-9)+3(3) \quad 4(1)+5(-2)+3(1)$

$\begin{pmatrix} -3 & 0 & 0 \\ 0 & -3 & 0 \\ 0 & 0 & -3 \end{pmatrix} = -3 \quad \begin{pmatrix} -7/-3 & 9/-3 & 1/-3 \\ 8/-3 & -9/-3 & -2/-3 \\ -4/-3 & 3/-3 & 1/-3 \end{pmatrix} = \begin{pmatrix} 7/3 & -3 & -1/3 \\ -8/3 & 3 & 2/3 \\ 4/3 & -1 & -1/3 \end{pmatrix}$

c) $\begin{pmatrix} 0 & 3 & 3 \\ 1 & 2 & 3 \\ 1 & 4 & 6 \end{pmatrix}$

$B_{11} = (-1)^2 \begin{vmatrix} 2 & 3 \\ 4 & 6 \end{vmatrix} = 12 - 12 = 0$, $B_{12} = (-1)^3 \begin{vmatrix} 1 & 3 \\ 1 & 6 \end{vmatrix} = 6 - 3 = -6$

$B_{13} = (-1)^4 \begin{vmatrix} 1 & 2 \\ 1 & 4 \end{vmatrix} = 4 - 2 = 2$, $B_{21} = (-1)^3 \begin{vmatrix} 3 & 3 \\ 4 & 6 \end{vmatrix} = 18 - 12 = -6$

$B_{22} = (-1)^4 \begin{vmatrix} 0 & 3 \\ 1 & 6 \end{vmatrix} = 0 - 3 = -3$, $B_{23} = (-1)^5 \begin{vmatrix} 0 & 3 \\ 1 & 4 \end{vmatrix} = 0 - 3 = 3$

$B_{31} = (-1)^4 \begin{vmatrix} 3 & 3 \\ 2 & 3 \end{vmatrix} = 9 - 6 = 3$, $B_{32} = (-1)^5 \begin{vmatrix} 0 & 3 \\ 1 & 3 \end{vmatrix} = 0 - 3 = 3$

$B_{33} = (-1)^6 \begin{vmatrix} 0 & 3 \\ 1 & 2 \end{vmatrix} = 0 - 3 = 3$

$$Cof(B) = \begin{vmatrix} 0 & -6 & 2 \\ -6 & -3 & 3 \\ 3 & 3 & 3 \end{vmatrix}$$

$$Adj(B) = \begin{vmatrix} 0 & -6 & 3 \\ -6 & -3 & 3 \\ 2 & 3 & 3 \end{vmatrix}$$

$$\begin{pmatrix} 0 & 3 & 3 \\ 1 & 2 & 3 \\ 1 & 4 & 6 \end{pmatrix} \begin{matrix} 0 & 3 \\ 1 & 2 \\ 1 & 4 \end{matrix} = 0(2)(6) + 3(3)(1) + 3(1)(4) - 3(1)(6) - 0(3)(4) - 3(2)(1)$$

$= 0 + 9 + 12 - 18 - 6 = -3$

$$\begin{vmatrix} 0/_3 & -6/_{-3} & 3/_{-3} \\ -6/_{-3} & -3/_{-3} & 3/_{-3} \\ 2/_{-3} & 3/_{-3} & 3/_{-3} \end{vmatrix} = \begin{vmatrix} 0 & 2 & -1 \\ 2 & 1 & -1 \\ 2/_{-3} & -1 & -1 \end{vmatrix}$$

$A \cdot A^{-1} = I$

$|A| \neq 0$

48.- a) $A = \begin{pmatrix} k & -k & 3 \\ 0 & k+1 & 1 \\ k & -8 & k-1 \end{pmatrix} \begin{matrix} k & -k \\ 0 & k+1 \\ k & -8 \end{matrix} = k(k+1)(k-1) - k(1)(k) + 3(0)\cdot 8 + k(0)(k-1) - k(1)(-8) - 3(k+1)(k)$

$= (k^2+k)(k-k) - k^2 + 0 + 0 + 8k - 3k^2 - 3k = k^3 - 4k^2 + 4k$

$|A| = k^3 - 4k^2 + 4k = 0$

$= k(k^2 - 4k + 4) = k(k-2)^2 \longrightarrow k = 0$

$(k-2)^2 = 0$

$k - 2 = 0$

$k = 2$

$\therefore$ La matriz es invertible cuando $k \neq \{0, 2\}$

b) $B = \begin{pmatrix} k & k & 0 \\ k^2 & 2 & k \\ 0 & k & k \end{pmatrix} \begin{matrix} k & k \\ k^2 & 2 \\ 0 & k \end{matrix} = k(2)(k) + k(k)(0) + 0(k^2)(k) - k(k^2)(k) - k(k)(k) - 0(2)(0)$

$= 2k^2 + 0 + 0 - k^4 - k^3 - 0 = -k^4 - k^3 + 2k^2$

$|B| = -k^4 - k^3 + 2k^2 = 0$

$= -k^2(k^2 + x - 2) = 0 \longrightarrow -k^2(k+2)(k-1) = 0 \; (-1)$

$= k^2(k+2)(k-1) = 0$

$k^2 = 0 \rightarrow k = 0$

$k + 2 = 0 \rightarrow k = -2$

$k - 1 = 0 \rightarrow k = 1$

$\therefore$ La matriz es invertible cuando $k \neq \{-2, 0, 1\}$

49-a) $x_1 + 3x_2 + 4x_3 = 3$
$2x_1 + 6x_2 + 9x_3 = 5$
$3x_1 + x_2 - 2x_3 = 7$

$$\left(\begin{array}{ccc|c} 1 & 3 & 4 & 3 \\ 2 & 6 & 9 & 5 \\ 3 & 1 & -2 & 7 \end{array}\right)$$

$$\left(\begin{array}{ccc|cc} 1 & 3 & 4 & 1 & 3 \\ 2 & 6 & 9 & 2 & 6 \\ 3 & 1 & -2 & 3 & 1 \end{array}\right) = 1(6)(-2) + 3(9)(3) + 4(2)(1) - 3(2)(-2) - 1(9)(1) - 4(6)(3)$$

$$= -12 + 81 + 8 + 12 - 9 - 72 = 8$$

$$x_1 = \frac{\left|\begin{array}{ccc|cc} 3 & 3 & 4 & 3 & 3 \\ 5 & 6 & 9 & 5 & 6 \\ 7 & 1 & -2 & 7 & 1 \end{array}\right|}{8} = 3(6)(-2) + 3(9)(7) + 4(5)(1) - 3(5)(-2) - 3(9)(1) - 4(6)(7)$$

$$= -36 + 189 + 20 + 30 - 27 - 168 = 8$$

$$x_1 = \frac{8}{8} = 1$$

$$x_2 = \frac{\left|\begin{array}{ccc|cc} 1 & 3 & 4 & 1 & 3 \\ 2 & 5 & 9 & 2 & 5 \\ 3 & 7 & -2 & 3 & 7 \end{array}\right|}{8} = 1(5)(-2) + 3(9)(3) + 4(2)(7) - 3(2)(-2) - 1(9)(7) - 4(5)(3)$$

$$= -10 + 81 + 56 + 12 - 63 - 60 = 16$$

$$x_2 = \frac{16}{8} = 2$$

$$x_3 = \frac{\left|\begin{array}{ccc|cc} 1 & 3 & 3 & 1 & 3 \\ 2 & 6 & 5 & 2 & 6 \\ 3 & 1 & 7 & 3 & 1 \end{array}\right|}{8} = 1(6)(7) + 3(5)(3) + 3(2)(1) - 3(2)(7) - 1(5)(1) - 3(6)(3)$$

$$= 42 + 45 + 6 - 42 - 5 - 54 = -8$$

$$x_3 = \frac{-8}{8} = -1$$

b) $x_1 + 2x_2 + x_3 = 9$
$x_1 + 3x_2 - x_3 = 4$
$x_1 + 4x_2 - x_3 = 7$

$$\left(\begin{array}{ccc|c} 1 & 2 & 1 & 9 \\ 1 & 3 & -1 & 4 \\ 1 & 4 & -1 & 7 \end{array}\right)$$

$$\left|\begin{array}{ccc|cc} 1 & 2 & 1 & 1 & 2 \\ 1 & 3 & -1 & 1 & 3 \\ 1 & 4 & -1 & 1 & 4 \end{array}\right| = 1(3)(-1) + 2(-1)(1) + 1(1)(4) - 2(1)(-1) - 1(-1)(4) - 1(3)(1)$$

$$= -3 - 2 + 4 + 2 + 4 - 3 = 2$$

$$x_1 = \frac{\left|\begin{array}{ccc|cc} 9 & 2 & 1 & 9 & 2 \\ 4 & 3 & -1 & 4 & 3 \\ 7 & 4 & -1 & 7 & 4 \end{array}\right|}{2} = 9(3)(-1) + 2(-1)(7) + 1(4)(4) - 2(4)(-1) - 9(-1)(4) - 1(3)(7)$$

$$= -27 - 14 + 16 + 8 + 36 - 21 = -2$$

$$x_1 = \frac{-2}{2} = -1$$

$$x_2 = \frac{\left|\begin{array}{ccc|cc} 1 & 9 & 1 & 1 & 9 \\ 1 & 4 & -1 & 1 & 4 \\ 1 & 7 & -1 & 1 & 7 \end{array}\right|}{2} = 1(4)(-1) + 9(-1)(1) + 1(1)(7) - 9(1)(-1) - 1(-1)(7) - 1(4)(1)$$

$$= -4 - 9 + 7 + 9 + 7 - 4 = 6$$

$$x_2 = \frac{6}{2} = 3$$

$$x_3 = \frac{\left|\begin{array}{ccc|cc} 1 & 2 & 9 & 1 & 2 \\ 1 & 3 & 4 & 1 & 3 \\ 1 & 4 & 7 & 1 & 4 \end{array}\right|}{2} = 1(3)(7) + 2(4)(1) + 9(1)(4) - 2(1)(7) - 1(4)(4) - 9(3)(1)$$

$$= 21 + 8 + 36 - 14 - 16 - 27 = 8$$

$$x_3 = \frac{8}{2} = 4$$

50.- a) Sean: x_1 = No. de bolsas de mezcla de la casa

x_2 = No. de bolsas de mezcla especial

x_3 = No. de bolsas de mezcla gourmet

Casa Especial Gourmet

$300x_1 + 200x_2 + 100x_3 = 30000$

$200x_1 + 100x_2 + 200x_3 = 25000$

$0x_1 \quad 200x_2 + 200x_3 = 15000$

b)
$$\left(\begin{array}{ccc|c} 300 & 200 & 100 & 30000 \\ 200 & 100 & 200 & 25000 \\ 0 & 200 & 200 & 15000 \end{array}\right)$$

c)
$$\left(\begin{array}{ccc|ccc} 300 & 200 & 100 & 1 & 0 & 0 \\ 200 & 100 & 200 & 0 & 1 & 0 \\ 0 & 200 & 200 & 0 & 0 & 1 \end{array}\right)$$

$$R_1 \cdot \tfrac{1}{300} \left(\begin{array}{ccc|ccc} 1 & 2/3 & 1/3 & 1/300 & 0 & 0 \\ 200 & 100 & 200 & 0 & 1 & 0 \\ 0 & 200 & 200 & 0 & 0 & 1 \end{array}\right) R_2 - 200R_1 \left(\begin{array}{ccc|ccc} 1 & 2/3 & 1/3 & 1/300 & 0 & 0 \\ 0 & -100/3 & 400/3 & -2/3 & 1 & 0 \\ 0 & 200 & 200 & 0 & 0 & 1 \end{array}\right)$$

$$\begin{array}{l} R_2 \cdot \left(-\tfrac{3}{100}\right) \\ R_3 - 200R_2 \end{array} \left(\begin{array}{ccc|ccc} 1 & 2/3 & 1/3 & 1/300 & 0 & 0 \\ 0 & 1 & -4 & 1/50 & -3/100 & 0 \\ 0 & 0 & 1000 & -4 & 6 & 1 \end{array}\right) R_3 \cdot \tfrac{1}{1000} \quad \begin{array}{l} R_1 - \tfrac{1}{3}R_3 \\ R_2 + 4R_3 \end{array} \left(\begin{array}{ccc|ccc} 1 & 2/3 & 0 & 7/1500 & -1/500 & -1/3000 \\ 0 & 1 & 0 & 1/250 & -3/500 & 1/250 \\ 0 & 0 & 1 & -1/250 & 3/500 & 1/1000 \end{array}\right)$$

$$R_1 - \tfrac{2}{3}R_2 \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 1/500 & 1/500 & -3/1000 \\ 0 & 1 & 0 & 1/250 & -3/500 & 1/250 \\ 0 & 0 & 1 & -1/250 & 3/500 & 1/1000 \end{array}\right) \quad \begin{pmatrix} 1/500 & 1/500 & -3/1000 \\ 1/250 & -3/500 & 1/250 \\ -1/250 & 3/500 & 1/1000 \end{pmatrix}\begin{pmatrix} 30000 \\ 25000 \\ 15000 \end{pmatrix}$$

$$\begin{array}{l} \left(\tfrac{1}{500}\right)(30000) + \tfrac{1}{500}(25000) - \tfrac{3}{1000}(15000) \\ \left(\tfrac{1}{250}\right)(30000) - \tfrac{3}{500}(25000) + \tfrac{1}{250}(15000) \\ \left(-\tfrac{1}{250}\right)(30000) + \tfrac{3}{500}(25000) + \tfrac{1}{1000}(15000) \end{array} = \begin{pmatrix} 65 \\ 30 \\ 45 \end{pmatrix}$$

Sol. única
(65, 30, 45)

Ciclón Cíclope Cicloide

51.- Sean x_1 = Ciclón   a) $10x_1 + 12x_2 + 6x_3 = 1560$

x_2 = Cíclope $2x_1 + 2.5x_2 + 1.5x_3 = 340$

x_3 = Cicloide $2x_1 + 2x_2 + 1.5x_3 = 320$

b) $\left(\begin{array}{ccc|c} 10 & 12 & 6 & 1560 \\ 2 & 5/2 & 3/2 & 340 \\ 2 & 2 & 3/2 & 320 \end{array}\right)$

c) $B = \begin{pmatrix} 10 & 12 & 6 \\ 2 & 5/2 & 3/2 \\ 2 & 2 & 3/2 \end{pmatrix}$ $B_{11} = (-1)^2 \begin{vmatrix} 5/2 & 3/2 \\ 2 & 3/2 \end{vmatrix} = 15/4 - 3 = 3/4$

$B_{12} = (-1)^3 \begin{vmatrix} 2 & 3/2 \\ 2 & 3/2 \end{vmatrix} = 3 - 3 = \varnothing$, $B_{13} = (-1)^4 \begin{vmatrix} 2 & 5/2 \\ 2 & 2 \end{vmatrix} = 4 - 5 = -1$

$B_{21} = (-1)^3 \begin{vmatrix} 12 & 6 \\ 2 & 3/2 \end{vmatrix} = 18 - 12 = -6$, $B_{22} = (-1)^4 \begin{vmatrix} 10 & 6 \\ 2 & 3/2 \end{vmatrix} = 15 - 12 = 3$

$B_{23} = (-1)^5 \begin{vmatrix} 10 & 12 \\ 2 & 2 \end{vmatrix} = 20 - 24 = 4$, $B_{31} = (-1)^4 \begin{vmatrix} 12 & 6 \\ 5/2 & 3/2 \end{vmatrix} = 18 - 15 = 3$

$B_{32} = (-1)^5 \begin{vmatrix} 10 & 6 \\ 2 & 3/2 \end{vmatrix} = 15 - 12 = -3$, $B_{33} = (-1)^6 \begin{vmatrix} 10 & 12 \\ 2 & 5/2 \end{vmatrix} = 25 - 24 = 1$

$\operatorname{cof} B = \begin{vmatrix} 3/4 & 0 & -1 \\ -6 & 3 & 4 \\ 3 & -3 & 1 \end{vmatrix}$ $\operatorname{Adj} B = \begin{vmatrix} 3/4 & -6 & 3 \\ 0 & 3 & -3 \\ -1 & 4 & 1 \end{vmatrix}$

$B(\operatorname{Adj} B) = \begin{vmatrix} 10 & 12 & 6 \\ 2 & 5/2 & 3/2 \\ 2 & 2 & 3/2 \end{vmatrix} \begin{vmatrix} 3/4 & -6 & 3 \\ 0 & 3 & -3 \\ -1 & 4 & 1 \end{vmatrix} = \begin{pmatrix} 3/2 & 0 & 0 \\ 0 & 3/2 & 0 \\ 0 & 0 & 3/2 \end{pmatrix} = 3/2$

$= \begin{matrix} 10(3/4) + 12(0) + 6(-1) & 10(-6) + 12(3) + 6(4) & 10(3) + 12(-3) + 6(1) \\ 2(3/4) + 5/2(0) + 3/2(-1) & 2(-6) + 5/2(3) + 3/2(4) & 2(3) + 5/2(-3) + 3/2(1) \\ 2(3/4) + 2(0) + 3/2(-1) & 2(-6) + 2(3) + 3/2(4) & 2(3) + 2(-3) + 3/2(1) \end{matrix}$

$$\frac{3}{2}\begin{pmatrix} 3/4 & -6 & 3 \\ 0 & 3 & -3 \\ -1 & 4 & 1 \end{pmatrix} = \begin{pmatrix} \frac{3/4}{3/2} & -6/\frac{3}{2} & 3/\frac{3}{2} \\ 0/\frac{3}{2} & 3/\frac{3}{2} & -3/\frac{3}{2} \\ -1/\frac{3}{2} & 4/\frac{3}{2} & 1/\frac{3}{2} \end{pmatrix}$$

$$= \begin{pmatrix} 1/2 & -4 & 2 \\ 0 & 2 & -2 \\ -2/3 & 8/3 & 2/3 \end{pmatrix} \begin{pmatrix} 1560 \\ 340 \\ 320 \end{pmatrix}$$

$$= \begin{matrix} 1/2(1560) - 4(340) + 2(320) \\ 0(1560) + 2(340) - 2(320) \\ -2/3(1560) + 8/3(340) + 2/3(320) \end{matrix} = \begin{pmatrix} 60 \\ 40 \\ 80 \end{pmatrix}$$

Sol Única $(60, 40, 80)$