Taller 3

1. $P_0 = 0$

$K = 1, 2, 3, 4, 5$

a) $2x + 8y - z = 11$

$5x - 12y + z = 10$

$-x + y + 14z = 3$

Paso 1: Despejar una variable de cada ecuación

$$x = \frac{11 + z - 8y}{2}$$

$$y = -\left[\frac{10 - z - 5x}{12}\right] \Rightarrow y = \frac{5x + z - 10}{12}$$

$$z = \frac{3 + x - y}{14}$$

Paso 2: $x^{(0)}, y^{(0)}, z^{(0)}$

Paso 3 $x^{(1)} = \dfrac{11 + z^{(0)} - 8y^{(0)}}{2} = \dfrac{11}{2}$

0

$$y^{(1)} = \frac{5\left(\frac{11}{2}\right) + 0 - 10}{12} = \frac{35}{24}$$

$$z^{(1)} = \frac{3 + x^{0} - y^{0}}{14} = \frac{3 + \frac{11}{2} - \frac{35}{24}}{14} = \frac{169}{336}$$

Paso 4: Repetir paso 3 hasta llegar a la aproximación deseada.

1

$$x^{(2)} = \frac{11 + z^{(1)} - 8y^{(1)}}{2} = \frac{11 + \frac{169}{336} - 8\left(\frac{35}{24}\right)}{2} = \frac{-55}{672}$$

$$y^{(2)} = \frac{5x^{(2)} + z^{(1)} - 10}{12} = \frac{5\left[\frac{-55}{672}\right] + \frac{169}{336} - 10}{12} = \frac{-317}{384}$$

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$$z^{(2)} = \frac{3 + x^{(2)} - y^{(2)}}{14} = \frac{3 + \left(\frac{-55}{672}\right) - \left(\frac{-317}{384}\right)}{14} = 0.2674053997$$

2

$$x^{(3)} = \frac{11 + z^{(2)} - 8y^{(2)}}{2} = 8.73579$$

$$y^{(3)} = \frac{5x^{(3)} + z^{(2)} - 10}{12} = 2.91219$$

$$z^{(3)} = \frac{3 + x^{(3)} - y^{(3)}}{14} = 0.64458$$

3

$$x^{(4)} = \frac{11 + z^{(3)} - 8y^{(3)}}{2} = -5.81651$$

$$y^{(4)} = \frac{5x^{(4)} + z^{(3)} - 10}{12} = -3.20733$$

$$z^{(4)} = \frac{3 + x^{(4)} - 8y^{(4)}}{14} = 0.02970$$

4

$$x^{(5)} = \frac{11 + z^{(4)} - 8y^{(4)}}{2} = 18.34293$$

$$y^{(5)} = \frac{5x^{(5)} + z^{(4)} - 10}{12} = 6.81182$$

$$z^{(5)} = \frac{3 + x^{(5)} - 8y^{(5)}}{14} = 1.03794$$

2.

$$x^{(6)} = \frac{11 + z^{(5)} - 8y^{(5)}}{2} = 21.22832$$

$$y^{(6)} = \frac{5x^{(6)} + z^{(5)} - 10}{12} = -9.59197$$

$$z^{(6)} = \frac{3 + 16x^{(6)} - 8y^{(6)}}{2} = -0.61686$$

2. a) $9A + 20B + 5C = 139'500\,000$

$30A + 150B + 30C = 894'000\,000$

$0.01A + 0.002B + 0.3C = 2'372\,800$

b)
$$
\left[\begin{array}{ccc|c}
9 & 20 & 5 & 139\,500\,000 \\
30 & 150 & 30 & 894\,000\,000 \\
0.01 & 0.002 & 0.3 & 2'372\,800
\end{array}\right]
\begin{array}{l}
\\
(E_2 - \frac{10}{3}E_1) \rightarrow \\
(E_3 - \frac{1}{900}E_1) \rightarrow
\end{array}
$$

$$
\begin{array}{l}
\\
\text{Pivote} \rightarrow \\
m_{32} = \frac{-91}{375000}
\end{array}
\left[\begin{array}{ccc|c}
9 & 20 & 5 & 139\,500\,000 \\
0 & 250/3 & 40/3 & 429\,000\,000 \\
0 & -91/4500 & 53/180 & 2\,277\,800
\end{array}\right]
\begin{array}{l}
\\
\\
(E_3 + \frac{91}{375000}E_2) \rightarrow
\end{array}
$$

$$
\left[\begin{array}{ccc|c}
9 & 20 & 5 & 139\,500\,000 \\
0 & 250/3 & 40/3 & 429\,000\,000 \\
0 & 0 & \frac{3721}{12500} & 2\,321\,904
\end{array}\right]
$$

c) $C = \dfrac{2321904 \times 12500}{3721} = 7800000$

$B = \dfrac{3 * 429000000 - 40/3C}{250} = 3900000$

$A = \dfrac{139500000 - 20B - 5C}{9} = 2500000$

3. a) $15x - y + z = 12$

$2x + 8y - z = 11$

$-x + y + 4z = 3$

Paso 1: Despejar una variable de cada ecuación

$$x = \frac{12 + y - z}{15}$$

$$y = \frac{11 + z - 2x}{8}$$

$$z = \frac{3 + x - y}{4}$$

$x^{(0)} = (0,0,0)$

$x^{(1)} = \frac{12 + y^0 - z^0}{15} = \frac{12}{15}$

$y^{(1)} = \frac{11 + z^0 - 2x^0}{8} = \frac{11}{8}$

$z^{(1)} = \frac{3 + x^0 - y^0}{4} = \frac{3}{4}$

$x^{(2)} = \frac{12 + y^{(1)} - z^{(1)}}{15} = 0.84167$

$y^{(2)} = \frac{11 + z^1 - 2x^1}{8} = 1.26875$

$z^{(2)} = \frac{3 + x^{(1)} - y^{(1)}}{4} = 0.60625$

$x^{(3)} = \frac{12 + y^{(2)} - z^{(2)}}{15} = 0.84419$

$y^{(3)} = \frac{11 + z^{(2)} - 2x^{(2)}}{8} = 1.24036$

$z^{(3)} = \frac{3 + x^{(2)} - y^{(2)}}{4} = 0.64323$

$x^{(4)} = \frac{12 + y^{(3)} - z^{(3)}}{15} = 0.83981$

$y^{(4)} = \frac{11 + z^{(3)} - 2x^{(3)}}{8} = 1.24436$

$z^{(4)} = \frac{3 + x^{(3)} - y^{(3)}}{4} = 0.65095$

$x^{(5)} = \frac{12 + y^{(4)} - z^{(4)}}{15} = 0.83956$

$y^{(5)} = \frac{11 + z^{(4)} - 2x^{(4)}}{8} = 1.24872$

$z^{(5)} = \frac{3 + x^{(4)} - y^{(4)}}{4} = 0.64886$

4. a) Demostrar $X \cdot Y = 0$

$$\cos\theta = \frac{\vec{X}\cdot\vec{y}}{|\vec{X}||\vec{y}|}$$

Si $\vec{X}\cdot\vec{y}$ son ortogonales, entonces $\theta = \frac{\pi}{2}$

$$\cos\frac{\pi}{2} = \frac{\vec{X}\cdot\vec{y}}{|\vec{X}||\vec{y}|} \longrightarrow 0 = \frac{\vec{X}\cdot\vec{y}}{|\vec{X}||\vec{y}|} \longrightarrow 0 = \vec{X}\cdot\vec{y}$$

Si $\vec{X}\,\vec{y}$ 0

$$\cos\theta = \frac{0}{|\vec{X}||\vec{y}|} \longrightarrow \cos\theta = 0 \qquad (0 \leq \theta \leq 180°)$$

$$\theta = \frac{\pi}{2}$$

b) Buscar dos vectores diferentes, y y z que sean ortogonales a $X = (4, -7, 5, 9)$

- $(4, -7, 5, 9)(a, b, c, d) = 0$

$4a - 7b + 5c + 9d = 0$

Si $a = 1$, $b = 2$ y $c = 3$

$4 - 14 + 15 + 9d = 0$

$9d = -5$

$d = -5/9$

Si $a = 1$, $b = 2$ y $d = 3$

$4 - 14 + 5c + 27 = 0$

$5c = 17$

$c = -\frac{17}{5}$

$y = (1, 2, 3, 5/9)$ ✓

$\vec{X}\cdot\vec{y} = 4\cdot1 + (-7\cdot2) + 5\cdot3 + 9\cdot\frac{5}{9} = 0$

$z = (1, 2, -\frac{17}{3}, 3)$ ✓

$\vec{X}\cdot\vec{z} = 4\cdot1 + (-7\cdot2) + 5\left(-\frac{17}{3}\right) + 9\cdot3$

$\vec{X}\cdot\vec{z} = 0$

- $X = (6, 2, -3, -3) \longrightarrow (6, 2, -3, -3)\cdot(a, b, c, d) = 6a + 2b - 3c - 3d$

Si $a = 1$, $b = 2$ y $c = 3$

$6 + 4 - 9 - 3d = 0$

$-3d = -1$

$d = \frac{1}{3}$

$y = (1, 2, 3, \frac{1}{3})$ ✓

$\vec{X}\cdot\vec{y} = 6\cdot1 + 2\cdot2 + (-3\cdot3) + \left(-3\cdot\frac{1}{3}\right) = 0$

Si $b=1$, $c=2$ y $d=3$ $\quad z=\left(\frac{13}{6}, 1, 2, 3\right)$ ✓

$6a+2-6-9=0$

$6a=13$

$a=\frac{13}{6}$

$\vec{x}\cdot\vec{z}=\left[6\cdot\frac{13}{6}\right]+2\cdot1+(-3\cdot2)+(-3\cdot3)$

$\vec{x}\cdot\vec{z}=0$

5. a) $T+C+R+A=700$

$T+2C=0.3R \longrightarrow T+2C-0.3R=0$

$0.1T+0.3C+0.84R+0.4A=480$

$C+985=2R+0.35A$

$T+C+R+A=700$

$T+2C-0.3R=0$

$0.1T+0.3C+0.84R+0.4A=480$

$C-2R-0.35A=-985$

$$AX=\begin{bmatrix}1&1&1&1\\1&2&-0.3&0\\0.1&0.3&0.84&0.4\\0&1&-2&-0.35\end{bmatrix} \qquad B=\begin{bmatrix}700\\0\\480\\-985\end{bmatrix}$$

b)

$$\begin{bmatrix}l_{11}&0&0&0\\l_{21}&l_{22}&0&0\\l_{31}&l_{32}&l_{33}&0\\l_{41}&l_{42}&l_{43}&l_{44}\end{bmatrix}\begin{bmatrix}U_{11}&U_{12}&U_{13}&U_{14}\\0&U_{22}&U_{23}&U_{24}\\0&0&U_{33}&U_{34}\\0&0&0&U_{44}\end{bmatrix}=\begin{bmatrix}1&1&1&1\\1&2&-0.3&0\\0.1&0.3&0.84&0.4\\0&1&-2&-0.35\end{bmatrix}$$

$L_{11} U_{11} = 1 \longrightarrow L_{11} = 1$ y $U_{11} = 1$

$L_{11} U_{12} = 1 \longrightarrow U_{12} = 1$

$L_{11} U_{13} = 1 \longrightarrow U_{13} = 1$

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ L_{21} & L_{22} & 0 & 0 \\ L_{31} & L_{32} & L_{33} & 0 \\ L_{41} & L_{42} & L_{43} & L_{44} \end{bmatrix} \begin{bmatrix} 1 & 1 & 1 & 1 \\ 0 & U_{22} & U_{23} & U_{24} \\ 0 & 0 & U_{33} & U_{34} \\ 0 & 0 & 0 & U_{44} \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & -0.3 & 0 \\ 0.1 & 0.33 & 0.84 & 0.4 \\ 0 & 1 & -2 & -0.35 \end{bmatrix}$$

$L_{21} U_{11} = 1$ y $L_{31} U_{11} = 0.1$ y $L_{41} U_{11} = 0$

$L_{21} = 1$ $\quad L_{31} = 0.1$ y $L_{41} = 0$

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 1 & L_{22} & 0 & 0 \\ 0.1 & L_{32} & L_{33} & 0 \\ 0 & L_{42} & L_{43} & L_{44} \end{bmatrix} \begin{bmatrix} 1 & 1 & 1 & 1 \\ 0 & U_{22} & U_{23} & U_{24} \\ 0 & 0 & U_{33} & U_{34} \\ 0 & 0 & 0 & U_{44} \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & -0.3 & 0 \\ 0.1 & 0.3 & 0.84 & 0.4 \\ 0 & 1 & -2 & -0.35 \end{bmatrix}$$

Ahora, para a_{22}

$L_{21} U_{12} + L_{22} U_{22} = a_{22}$ si $L_{22} = 1$

$1 + 1 U_{22} = 2 \longrightarrow U_{22} = 1$

$L_{31} U_{12} + L_{32} U_{22} = 0.3$

$0.1 + L_{32} = 0.3 \longrightarrow L_{32} = 0.2$

$L_{21} U_{13} + L_{22} U_{23} = -0.3$

$1 + U_{23} = -0.3$

$U_{23} = -0.3 - 1$

$U_{23} = -1.3$

$L_{21}U_{12} + L_{22}U_{22} = 1$

$1 + L_{22} = 1$

$L_{21}U_{14} + L_{22}U_{24} = 0$

$1 + U_{24} = 0$

$U_{24} = -1$

$$\begin{bmatrix}1 & 0 & 0 & 0\\ 1 & 1 & 0 & 0\\ 0.1 & 0.2 & L_{33} & 0\\ 0 & 1 & L_{43} & L_{44}\end{bmatrix}\begin{bmatrix}1 & 1 & 1 & 1\\ 0 & 1 & -1.3 & -1\\ 0 & 0 & U_{33} & U_{34}\\ 0 & 0 & 0 & U_{44}\end{bmatrix} = \begin{bmatrix}1 & 1 & 1 & 1\\ 1 & 2 & -0.3 & 0\\ 0.1 & 0.3 & 0.84 & 0.4\\ 0 & 1 & -2 & -0.35\end{bmatrix}$$

$L_{31}U_{13} + L_{32}U_{23} + L_{33}U_{33} = 0.84$ Si $L_{33} = 1$

$0.1 + 0.2(-1.3) + U_{33} = 0.84$

$U_{33} = 0.84 + 0.16 = 1$

$L_{31}U_{14} + L_{32}U_{24} + L_{33}U_{34} = 0.4$

$0.1 + -0.2 \quad U_{34} = 0.4$

$U_{34} = 0.5$

$L_{41}U_{13} + L_{42}U_{23} + L_{43}U = -2$

$0 \quad -1.3 + L_{43} = -2 \to L_{43} = -2 + 1.3 = -0.7$

$$\begin{bmatrix}1 & 0 & 0 & 0\\ 1 & 1 & 0 & 0\\ 0.1 & 0.2 & 1 & 0\\ 0 & 1 & -0.7 & L_{44}\end{bmatrix}\begin{bmatrix}1 & 1 & 1 & 1\\ 0 & 1 & -1.3 & -1\\ 0 & 0 & 1 & 0.5\\ 0 & 0 & 0 & U_{44}\end{bmatrix} = \begin{bmatrix}1 & 1 & 1 & 1\\ 1 & 2 & -0.3 & 0\\ 0.1 & 0.3 & 0.84 & 0.4\\ 0 & 1 & -2 & -0.35\end{bmatrix}$$

Si $L_{44} = 1$

$L_{41}U_{14} + L_{42}U_{24} + L_{43}U_{34} + L_{44}U_{44} = -0.35$

$0 + -1 \quad -0.35 + L_{44} = -0.35$

$L_{44} = -0.35 + 0.35 + 1$

$L_{44} = 1$

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$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 \\ 0.1 & 0.2 & 1 & 0 \\ 0 & 1 & -0.7 & 1 \end{bmatrix} \overset{U}{\begin{bmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & -1.3 & -1 \\ 0 & 0 & 1 & 0.5 \\ 0 & 0 & 0 & 1 \end{bmatrix}} = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & -0.3 & 0 \\ 0.1 & 0.3 & 0.84 & 0.4 \\ 0 & 1 & -2 & -0.35 \end{bmatrix}$$

c) $Ly = B$

$$\begin{aligned} T &= 700 \\ T + C &= 0 \\ 0.1T + 0.2C + R &= 480 \\ C - 0.7R + A &= -985 \end{aligned}$$

$T = 700$
$C = -700$

$0.1(700) + 0.2(-700) + R = 480$
$R = 480 - 70 + 140$
$R = 550$

$-700 - 0.7(550) + A = -985$
$A = -985 + 700 + 385$
$A = 100$

$y = \{700, -700, 550, 100\}$

$Ux = y$

$$\begin{aligned} T + C + R + A &= 700 \\ C - 1.3R - A &= -700 \\ R + 0.5A &= 550 \\ A &= 100 \end{aligned}$$

$A = 100$

$R = 550 - 50$
$R = 500$

$C - 1.3(500) - 100 = -700$
$C = -700 + 100 + 650$
$C = 50$

$T + 50 + 500 + 100 = 700$
$T = 50$

6. $A = \begin{bmatrix} -5 & 6 & 10 & 12 \\ 15 & 3 & 28 & 1 \\ 10 & -12 & -20 & -24 \end{bmatrix}$ $B = \begin{bmatrix} 7 & -6 & 3 \\ -6 & 2 & 11 \\ 10 & -12 & -20 \\ 6 & 17 & 3 \end{bmatrix}$

$C = \begin{bmatrix} 4 & 8 & 1 \\ 5 & 4 & 1 \\ 2 & 25 & 6 \end{bmatrix}$

a) Determinar $AB+C \rightarrow AB+C$

$AB = 3 \times 3$ $A = 3 \times 4$ $B = 4 \times 3$

$C_{11} = A_{11}B_{11} + A_{12}B_{21} + A_{13}B_{31} + A_{14}B_{41} =$
$C_{11} = -5 \cdot 7 + 6 \cdot (-6) + 10 \cdot 10 + 12 \cdot 6 = 101$

$C_{12} = A_{11}B_{12} + A_{12}B_{22} + A_{13}B_{32} + A_{14}B_{42}$
$C_{12} = -5 \cdot (-6) + 6 \cdot 2 + 10 \cdot (-12) + 12 \cdot 17 = 126$

$C_{13} = A_{11}B_{13} + A_{12}B_{23} + A_{13}B_{33} + A_{14}B_{43} =$
$C_{13} = -5 \cdot 3 + 6 \cdot 11 + 10 \cdot (-20) + 12 \cdot 3 = -113$

$C_{21} = A_{21}B_{11} + A_{22}B_{21} + A_{23}B_{31} + A_{24}B_{41} =$
$C_{21} = 15 \cdot 7 + 3 \cdot (-6) + 28 \cdot 10 + 1 \cdot 6 = 373$

$C_{22} = A_{21}B_{12} + A_{22}B_{22} + A_{23}B_{32} + A_{24}B_{42} =$
$C_{22} = 15(-6) + 3 \cdot 2 + 28 \cdot (-12) + 1 \cdot 17 = -400$

$C_{23} = A_{21}B_{13} + A_{22}B_{23} + A_{23}B_{33} + A_{24}B_{43} =$ $= -484$
$C_{23} = 15 \cdot 3 + 3 \cdot 11 + 28 \cdot (-20) + 1 \cdot 3 =$

$C_{31} = A_{31}B_{11} + A_{32}B_{21} + A_{33}B_{31} + A_{34}B_{41} =$
$C_{31} = 10 \cdot 7 \quad (-12) \cdot (-6) \quad (-20) \cdot 10 \quad (-24) \cdot 6 = -202$

$C_{32} = A_{31}B_{12} + A_{32}B_{22} + A_{33}B_{32} + A_{34}B_{42}$
$C_{32} = 10(-6) \quad (-12)(2) \quad (-20)(-12) \quad (-24)\,17 = -252$

$C_{33} = A_{31}B_{13} + A_{32}B_{23} + A_{33}B_{33} + A_{34}B_{43}$
$C_{33} = 10 \cdot 3 + (-12)\,11 + (-20)(-20) + (-24)\,3 = 236$

$C_{33} = B_{31}A_{13} + B_{32}A_{23} + B_{33}A_{33}$
$C_{33} = 10 \cdot 10 + (-12)\,28 + (-20)(-20) = 164$

$C_{34} = B_{31}A_{14} + B_{32}A_{24} + B_{33}A_{34}$
$C_{34} = 10 \cdot 12 + (-12) \cdot 1 + (-20)(-24) = 588$

$C_{41} = B_{41}A_{11} + B_{42}A_{21} + B_{43}A_{31}$
$C_{41} = 6 \cdot (-5) + 17 \cdot 15 + 3 \cdot 10 = 255$

$C_{42} = B_{41}A_{12} + B_{42}A_{22} + B_{43}A_{32}$
$C_{42} = 6 \cdot 6 + 17 \cdot 3 + 3(-12) = 51$

$C_{43} = B_{41}A_{13} + B_{42}A_{23} + B_{43}A_{33}$
$C_{43} = 6 \cdot 10 + 17 \cdot 28 + 3(-20) = 476$

$C_{44} = B_{41}A_{14} + B_{42}A_{24} + B_{43}A_{34}$
$C_{44} = 6 \cdot 12 + 17 \cdot 1 + 3(-24) = 17$

$$BA = \begin{bmatrix} -95 & -72 & -158 & -6 \\ 170 & -162 & -224 & -334 \\ -480 & 264 & 164 & 588 \\ 255 & 51 & 476 & 17 \end{bmatrix}$$

c) $CA = 3 \times 4$ $\quad C = 3 \times 3 \quad = \quad A = 3 \times 4$

$D_{11} = C_{11}A_{11} + C_{12}A_{21} + C_{13}A_{31}$
$D_{11} = 14(-5) + 8 \cdot 15 + 1 \cdot 10 = 60$

$D_{12} = C_{11} \cdot A_{12} + C_{12}A_{22} + C_{13}A_{32}$
$D_{12} = 14(6) + 8 \cdot 3 + 1(-12) = 96$

$D_{13} = C_{11} \cdot A_{13} + C_{12}A_{23} + C_{13}A_{33}$
$D_{13} = 14 \cdot 10 + 8 \cdot 28 + 1(-20) = 344$

$D_{14} = C_{11} \cdot A_{14} + C_{12}A_{24} + C_{13}A_{34}$
$D_{14} = 14 \cdot 12 + 8 \cdot 1 + 1(-24) = 152$

$D_{21} = C_{21}A_{11} + C_{22}A_{21} + C_{23}A_{31}$
$D_{21} = 5(-5) + 4 \cdot 15 + 1 \cdot 10 = 45$

$D_{22} = C_{21}A_{12} + C_{22}A_{22} + C_{23}A_{32}$
$D_{22} = 5 \cdot 6 + 4 \cdot 3 + 1(-12) = 30$

$D_{23} = C_{31}A_{13} + C_{32}A_{23} + C_{33}A_{33}$
$D_{23} = 5 \cdot 10 + 4 \cdot 28 + 1 \cdot 10 = 172$

$D_{24} = C_{31}A_{14} + C_{32}A_{24} + C_{33}A_{34}$
$D_{24} = 5 \cdot 12 + 4 \cdot 1 + 1 \cdot 12 = 40$

$D_{31} = C_{31}A_{11} + C_{32}A_{21} + C_{33}A_{31}$
$D_{31} = 2 \cdot -5 + 25 \cdot 15 + 6 \cdot 10 = 425$

$D_{32} = C_{31}A_{12} + C_{32}A_{22} + C_{33}A_{32}$
$D_{32} = 2 \cdot 6 + 23 \cdot 3 + 6 \cdot -12 = 15$

$D_{33} = C_{31}A_{13} + C_{32}A_{23} + C_{33}A_{33}$
$D_{33} = 2 \cdot 10 + 25 \cdot 28 + 6 \cdot -20 = 600$

$D_{34} = C_{31}A_{14} + C_{32}A_{24} + C_{33}A_{34}$
$D_{34} = 2 \cdot 12 + 25 \cdot 1 + 6 \cdot -24 = -95$

$$CA = \begin{bmatrix} 60 & 96 & 344 & 152 \\ 15 & 30 & 142 & 40 \\ 425 & 15 & 600 & -95 \end{bmatrix}$$

c) Tanto A como B no cumplen que m y n sean iguales por lo tanto no es posible hallar determinante.

Determinante de C

$$C = \begin{bmatrix} 14 & 8 & 1 \\ 5 & 4 & 1 \\ 2 & 25 & 6 \end{bmatrix}$$

$$14 \det \begin{bmatrix} 4 & 1 \\ 25 & 6 \end{bmatrix} - 8 \det \begin{bmatrix} 5 & 1 \\ 2 & 6 \end{bmatrix} + 1 \det \begin{bmatrix} 5 & 4 \\ 2 & 25 \end{bmatrix}$$

$$14(4 \cdot 6 - 25 \cdot 1) - 8(5 \cdot 6 - 2) + 1(5 \cdot 25 - 2 \cdot 4) = -121$$