✓ ¡Felicitaciones! ¡Aprobaste!

| Calificación recibida 90 % | Calificación del último envío 90 % | Para Aprobar 60 % o más | **Ir al siguiente elemento** |

1. The system of equations given by

$$2x_1 + 2x_2 + x_3 = 5,$$

$$x_1 + 3x_2 + x_3 = 2,$$

$$3x_1 + 4x_2 + 5x_3 = 1,$$

is written in matrix form as

1 / 1 punto

○ $$\begin{pmatrix} 2 & 1 & 3 \\ 2 & 3 & 4 \\ 1 & 1 & 5 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 5 \\ 2 \\ 1 \end{pmatrix}$$

◉ $$\begin{pmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 3 & 4 & 5 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 5 \\ 2 \\ 1 \end{pmatrix}$$

○ $$\begin{pmatrix} 2 & 2 & 1 & 5 \\ 1 & 3 & 1 & 2 \\ 3 & 4 & 5 & 1 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$$

○ $$\begin{pmatrix} x_1 & x_2 & x_3 \end{pmatrix} \begin{pmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 3 & 4 & 5 \end{pmatrix} = \begin{pmatrix} 5 & 2 & 1 \end{pmatrix}$$

✓ **Correcto**

2. The augmented matrix for the system of equations

$$2x_1 + 2x_2 + x_3 = 5,$$

$$x_1 + 3x_2 + x_3 = 2,$$

$$3x_1 + 4x_2 + 5x_3 = 1,$$

is given by

○ $\begin{pmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 3 & 4 & 5 \end{pmatrix}$

○ $\begin{pmatrix} 2x_1 & 2x_2 & x_3 & 5 \\ x_1 & 3x_2 & x_3 & 2 \\ 3x_1 & 4x_2 & 5x_3 & 1 \end{pmatrix}$

◉ $\begin{pmatrix} 2 & 2 & 1 & 5 \\ 1 & 3 & 1 & 2 \\ 3 & 4 & 5 & 1 \end{pmatrix}$

○ $\begin{pmatrix} 5 & 2 & 2 & 1 \\ 2 & 1 & 3 & 1 \\ 1 & 3 & 4 & 5 \end{pmatrix}$

✓ **Correcto**

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3. Perform Gaussian elimination without row interchange on the following augmented matrix:

$$\begin{pmatrix} 1 & 2 & -1 & 2 \\ 2 & 6 & 3 & 7 \\ 1 & 4 & 2 & 9 \end{pmatrix}.$$

Which matrix can be the result?

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

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

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

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

✓ **Correcto**

4. Which matrix is not in reduced row echelon form?

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◉ $\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & -1 \end{pmatrix}$

○ $\begin{pmatrix} 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$

○ $\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & -1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$

○ $\begin{pmatrix} 1 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$

⊗ **Incorrecto**
Review Reduced Row Echelon Form and associated practice problems.

5. The inverse of $\begin{pmatrix} 1 & 0 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 1 \end{pmatrix}$ is

1/1 punto

○ $\begin{pmatrix} 0 & -1 & 1 \\ -1 & 0 & 1 \\ 1 & 1 & 1 \end{pmatrix}$

○ $\begin{pmatrix} 0 & -1 & 1 \\ -1 & 0 & 1 \\ -1 & 1 & 1 \end{pmatrix}$

○ $\begin{pmatrix} 0 & -1 & 1 \\ -1 & 0 & 1 \\ 1 & -1 & 1 \end{pmatrix}$

◉ $\begin{pmatrix} 0 & -1 & 1 \\ -1 & 0 & 1 \\ 1 & 1 & -1 \end{pmatrix}$

✓ **Correcto**

6. Which of the following is the elementary matrix that multiplies the third row of a four-by-four matrix by 2 and adds the result to the fourth row?

1/1 punto

○ $\begin{pmatrix} 1 & 0 & 0 & 0 \\ 2 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$

○ $\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 2 \\ 0 & 0 & 0 & 1 \end{pmatrix}$

◉ $\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 2 & 1 \end{pmatrix}$

○ $\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 2 & 0 & 0 & 1 \end{pmatrix}$

✓ Correcto

7. Which of the following is the LU decomposition of $\begin{pmatrix} 2 & -2 & 1 \\ 4 & -2 & 3 \\ -4 & 8 & -2 \end{pmatrix}$?

1/1 punto

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

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

○ $\begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 1/2 \\ -2 & 2 & 2 \end{pmatrix} \begin{pmatrix} 2 & -2 & 1 \\ 0 & 2 & 2 \\ 0 & 0 & -2 \end{pmatrix}$

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

✓ Correcto

8.

Suppose $L = \begin{pmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ -2 & -5 & 1 \end{pmatrix}$, $U = \begin{pmatrix} 6 & -7 & 2 \\ 0 & -7 & -1 \\ 0 & 0 & -1 \end{pmatrix}$, and $b = \begin{pmatrix} 1 \\ 0 \\ 1 \end{pmatrix}$. Solve $LUx = b$ by letting $y = Ux$. The solutions for y and x are

○ $y = \begin{pmatrix} 1 \\ 1 \\ 8 \end{pmatrix}, x = \begin{pmatrix} 1 \\ 4 \\ -8 \end{pmatrix}$

◉ $y = \begin{pmatrix} 1 \\ 1 \\ 8 \end{pmatrix}, x = \begin{pmatrix} 4 \\ 1 \\ -8 \end{pmatrix}$

○ $y = \begin{pmatrix} 8 \\ 1 \\ 1 \end{pmatrix}, x = \begin{pmatrix} 1 \\ 4 \\ -8 \end{pmatrix}$

○ $y = \begin{pmatrix} 8 \\ 1 \\ 1 \end{pmatrix}, x = \begin{pmatrix} 4 \\ 1 \\ -8 \end{pmatrix}$

✓ **Correcto**

9.

Suppose $M = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 3 & 1 \end{pmatrix}$. Which matrix is M^{-1}?

○ $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 3 \\ 0 & 0 & 1 \end{pmatrix}$

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

○ $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 3 & 1 \end{pmatrix}$

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

✓ **Correcto**

10. From Gaussian elimination, one obtains $M_3 M_2 M_1 A = U$, where U is upper triangular. If $A = LU$, which is the lower triangular matrix L?

○ $M_1 M_2 M_3$

○ $M_3 M_2 M_1$

◉ $M_1^{-1} M_2^{-1} M_3^{-1}$

○ $M_3^{-1} M_2^{-1} M_1^{-1}$

✓ Correcto