¡Felicitaciones! ¡Aprobaste!

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Para Aprobar 60 % o más

Ir al siguiente elemento

1. Which set of three-by-one matrices (with real number scalars) is not a vector space? **1 / 1 punto**

- ○ The set of three-by-one matrices with zero in the third row.
- ◉ The set of three-by-one matrices with the first row one larger than the third row.
- ○ The set of three-by-one matrices with the sum of all the rows equal to zero.
- ○ The set of three-by-one matrices with the first row equal to the negative of the third row.

Correcto

2. Which of the following sets of vectors are linearly independent? **0 / 1 punto**

- ◉ $\left\{ \begin{pmatrix} 2 \\ 1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ -1 \\ 2 \end{pmatrix}, \begin{pmatrix} 2 \\ 3 \\ -1 \end{pmatrix} \right\}$
- ○ $\left\{ \begin{pmatrix} 1 \\ -3 \\ 4 \end{pmatrix}, \begin{pmatrix} 0 \\ -1 \\ 1 \end{pmatrix}, \begin{pmatrix} 3 \\ 2 \\ 1 \end{pmatrix} \right\}$
- ○ $\left\{ \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 \\ -4 \\ 5 \end{pmatrix}, \begin{pmatrix} 3 \\ 2 \\ 1 \end{pmatrix} \right\}$
- ○ $\left\{ \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}, \begin{pmatrix} 1 \\ 1 \\ 2 \end{pmatrix}, \begin{pmatrix} 2 \\ 1 \\ 2 \end{pmatrix} \right\}$

Incorrecto

Review Linear Independence and associated practice problems.

3. What is the dimension of the vector space consisting of five-by-one column matrices where the rows sum to zero and the first row is equal to the second row? **1 / 1 punto**

- ○ 5
- ○ 4
- ◉ 3
- ○ 2

✓ **Correcto**

4. Which of the following is NOT an orthonormal basis for the vector space of all three-by-one matrices with the first row equal to twice the third row? **0 / 1 punto**

- ◉ $\left\{ \frac{1}{\sqrt{5}} \begin{pmatrix} 2 \\ 0 \\ 1 \end{pmatrix}, \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix} \right\}$
- ○ $\left\{ \frac{1}{\sqrt{6}} \begin{pmatrix} 2 \\ 1 \\ 1 \end{pmatrix}, \frac{1}{\sqrt{30}} \begin{pmatrix} 2 \\ -5 \\ 1 \end{pmatrix} \right\}$
- ○ $\left\{ \frac{1}{\sqrt{6}} \begin{pmatrix} 2 \\ -1 \\ 1 \end{pmatrix}, \frac{1}{\sqrt{30}} \begin{pmatrix} 2 \\ 5 \\ 1 \end{pmatrix} \right\}$
- ○ $\left\{ \frac{1}{\sqrt{5}} \begin{pmatrix} 2 \\ 0 \\ 1 \end{pmatrix}, \frac{1}{\sqrt{6}} \begin{pmatrix} 2 \\ 0 \\ -1 \end{pmatrix} \right\}$

✗ **Incorrecto**

Review Vector Spaces and associated practice problems.

5. The Gram-Schmidt process applied to

1 / 1 punto

$$\{v_1, v_2\} = \left\{ \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ 0 \end{pmatrix} \right\}$$

results in

- (●) $\{u_1, u_2\} = \left\{ \frac{1}{\sqrt{2}} \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \frac{1}{\sqrt{2}} \begin{pmatrix} 1 \\ -1 \end{pmatrix} \right\}$
- ( ) $\{u_1, u_2\} = \left\{ \begin{pmatrix} 1 \\ 0 \end{pmatrix}, \begin{pmatrix} 0 \\ 1 \end{pmatrix} \right\}$
- ( ) $\{u_1, u_2\} = \left\{ \frac{1}{\sqrt{2}} \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ 0 \end{pmatrix} \right\}$
- ( ) $\{u_1, u_2\} = \left\{ \frac{1}{\sqrt{2}} \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \frac{1}{\sqrt{2}} \begin{pmatrix} -1 \\ 1 \end{pmatrix} \right\}$

Correcto

6. Which of the following sets of vectors form a basis for the null space of

1 / 1 punto

$$\begin{pmatrix} 1 & -1 & 1 & 1 \\ 4 & -4 & 3 & 6 \\ 2 & -2 & 1 & 3 \end{pmatrix}?$$

- ( ) $\left\{ \begin{pmatrix} 1 \\ 0 \\ -1 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 \\ 0 \\ 0 \\ -1 \end{pmatrix} \right\}$
- ( ) $\left\{ \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 \\ 0 \\ -1 \\ 0 \end{pmatrix} \right\}$
- ( ) $\left\{ \begin{pmatrix} 1 \\ 0 \\ -1 \\ 0 \end{pmatrix} \right\}$
- (●) $\left\{ \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix} \right\}$

Correcto

7. The general solution to the system of equations given by

1 / 1 punto

$$x_1 - x_2 + x_3 + x_4 = 1,$$

$$4x_1 - 4x_2 + 3x_3 + 6x_4 = 0,$$

$$2x_1 - 2x_2 + x_3 + 3x_4 = 0,$$

is

- $a \begin{pmatrix} 1 \\ 0 \\ -1 \\ 0 \end{pmatrix} + \begin{pmatrix} 3 \\ 0 \\ 0 \\ -2 \end{pmatrix}$
- (selected) $a \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix} + \begin{pmatrix} 3 \\ 0 \\ 0 \\ -2 \end{pmatrix}$
- $a \begin{pmatrix} 1 \\ 0 \\ -1 \\ 0 \end{pmatrix} + b \begin{pmatrix} 3 \\ 0 \\ 0 \\ -2 \end{pmatrix} + \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix}$
- $a \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix} + b \begin{pmatrix} 3 \\ 0 \\ 0 \\ -2 \end{pmatrix} + \begin{pmatrix} 1 \\ 0 \\ -1 \\ 0 \end{pmatrix}$

Correcto

8. What is the rank of the following matrix:

1 / 1 punto

$$\begin{pmatrix} 1 & -2 & 0 & 1 \\ 2 & -4 & 1 & 2 \\ 3 & -6 & 1 & 3 \end{pmatrix}?$$

- 1
- (selected) 2
- 3
- 4

Correcto

9. Which vector is the orthogonal projection of $\mathrm{v} = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$ onto $W = \operatorname{span}\left\{ \begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix}, \begin{pmatrix} 1 \\ -2 \\ -1 \end{pmatrix} \right\}$? **1 / 1 punto**

- ○ $\begin{pmatrix} 4 \\ -2 \\ -4 \end{pmatrix}$
- ◉ $\begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$
- ○ $\begin{pmatrix} \frac{2}{\sqrt{3}} + \frac{2}{\sqrt{6}} \\ \frac{2}{\sqrt{3}} - \frac{4}{\sqrt{6}} \\ -\frac{2}{\sqrt{3}} - \frac{2}{\sqrt{6}} \end{pmatrix}$
- ○ $\frac{1}{\sqrt{2}} \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$

✓ Correcto

10. Suppose we have data points given by $(x_n, y_n) = (0,0), (1,2)$, and $(2,1)$. Which is the best fit line to the data? **1 / 1 punto**

- ○ $y = 1$
- ○ $y = x$
- ◉ $y = \frac{1}{2} + \frac{1}{2}x$
- ○ $y = \frac{3}{2} - \frac{1}{4}x$

✓ Correcto