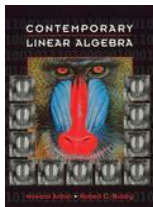


Chapter 7, Section 5 of *Contemporary Linear Algebra* by Anton and Busby



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1. Suppose the reduced row-echelon form of A is

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

Then $100 * \text{rank}(A) + 10 * \text{nullity}(A) + \text{nullity}(A^T)$ is

- A 513
- A 831
- C 851
- D 531
- E 853

Next Question

2. Which matrix has full column rank?

▶ A

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

▶ B

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

▶ C

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

▶ D

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

▶ E

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

Next Question

3. Let B be a singular $n \times n$ matrix and consider the $n \times 2n$ matrix $C = [B|B^T]$. (Choose the most correct answer.)

- ▶ A C must have full row rank
- ▶ B C may or may not have full row rank
- ▶ C C must have full column rank
- ▶ D C may or may not have full column rank
- ▶ E C has rank $2n$

Next Question

4. Find a vector $\mathbf{b} = (b_1, b_2, b_3)$ such that the system of equations $2x - y = b_1$, $4x + 3y = b_2$, $6x + 7y = b_3$ is inconsistent.

- ▶ A $(0, 1, 2)$
- ▶ B $(0, 0, 0)$
- ▶ C $(1, 2, 1)$
- ▶ D $(-1, 0, 1)$
- ▶ E $(-3, -1, 1)$

No more questions



RIGHT!

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Wrong...try again

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