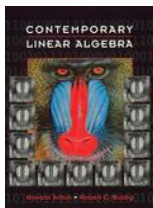


Chapter 7, Section 4 of *Contemporary Linear Algebra* by Anton and Busby



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1. If A is a non-zero 5×9 matrix with rank k and nullity n then

- ▶ A $1 \leq k \leq 9$ and $0 \leq n \leq 5$
- ▶ B $1 \leq k \leq 4$ and $0 \leq n \leq 5$
- ▶ C $1 \leq k \leq 4$ and $4 \leq n \leq 9$
- ▶ D $1 \leq k \leq 5$ and $4 \leq n \leq 8$
- ▶ E $1 \leq k \leq 5$ and $5 \leq n \leq 9$.

Next Question

2. Let $\mathbf{v}_1 = (1, 2, 1, 4)$, $\mathbf{v}_2 = (4, 3, -1, 1)$ and $\mathbf{v}_3 = (1, 0, -1, -2)$ and set $S = \{\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3\}$. Then

▶ A S can be extended to a basis of R^4 by adding the vector $(1, 0, 0, 0)$

▶ B S is a basis of R^3

▶ C S can be extended to a basis of R^4 by adding any vector orthogonal to \mathbf{v}_1 , \mathbf{v}_2 and \mathbf{v}_3

▶ D S is a basis of R^4

▶ E S cannot be extended to a basis of R^4 .

Next Question

3. Which vector is in the orthogonal complement of $W = \text{span}\{(2, 1, 1, 4), (3, -1, 1, 0)\}$?

- ▶ A $(2, 1, 1, 4)$
- ▶ B $(1, -2, 0, 4)$
- ▶ C $(2, 1, -5, 0)$
- ▶ D $(1, -4, -4, 2)$
- ▶ E $(5, 0, 2, 4)$

Next Question

4. Suppose that B is a 5×7 matrix of rank 2. The nullity of B^T is

- ▶ A 1
- ▶ B 2
- ▶ C 3
- ▶ D 4
- ▶ E 5

Next Question

5. The column vector \mathbf{u} satisfies

$$\mathbf{u}\mathbf{u}^T = \begin{bmatrix} 1 & * & 2 & * & * \\ & 1 & * & * & 1 \\ & & * & 4 & * & * \\ & & & * & 8 & 16 & * \\ -1 & * & * & * & * & 1 \end{bmatrix}.$$

(The *'s represent unknown numbers.) If the first component of \mathbf{u} is 1, what is the second component?

- A -2
- B -1
- C 1
- D 2
- E 4

No more questions



RIGHT!

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Wrong...try again

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