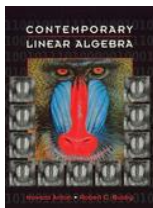


Chapter 6 , Section 3 of *Contemporary Linear Algebra* by Anton and Busby



Next Page

1. Let $P : \mathbf{R}^2 \rightarrow \mathbf{R}^2$ be the orthogonal projection onto the y -axis.

Then

▶ A $\ker(P) = \{(x, 0) : x \in \mathbf{R}\}$ and $\text{ran}(P) = \{(0, y) : y \in \mathbf{R}\}$

▶ B $\ker(P) = \{(0, x) : x \in \mathbf{R}\}$ and $\text{ran}(P) = \{(0, y) : y \in \mathbf{R}\}$

▶ C $\ker(P) = \{(x, y) : x, y \in \mathbf{R}\}$ and

$\text{ran}(P) = \{(x, y) : x, y \in \mathbf{R}\}$

▶ D $\ker(P) = \{(0, 0)\}$ and $\text{ran}(P) = \{(0, y) : y \in \mathbf{R}\}$

▶ E $\ker(P) = \{(0, x) : x \in \mathbf{R}\}$ and $\text{ran}(P) = \{(0, 0)\}$.

Next Question

2. Let Q be the contraction operator on \mathbf{R}^n defined by $Q(\mathbf{x}) = (1/4)\mathbf{x}$. Then

- ▶ A Q is one-to-one but not onto
- ▶ B Q is onto but not one-to-one
- ▶ C Q neither one-to-one nor onto
- ▶ D Q is one-to-one and onto
- ▶ E Q is onto, but Q may or may not be one-to-one.

Next Question

3. Let $T_A : \mathbf{R}^3 \rightarrow \mathbf{R}^3$ be the linear operator whose standard matrix is

$$A = \begin{pmatrix} 1 & 0 & 2 \\ 2 & 1 & -1 \\ 1 & -1 & 7 \end{pmatrix}$$

Find the kernel of T_A .

- A $\text{span}\{(-2, 0, 1)\}$
- B $\text{span}\{(2, -5, 1)\}$
- C $\text{span}\{(2, 5, -1)\}$
- D $\text{span}\{(0, 5, 1)\}$
- E $\text{span}\{(-2, 5, 1)\}$

Next Question

4. Which of the following vectors is not in the range of S , where $S : \mathbf{R}^3 \rightarrow \mathbf{R}^3$ is defined by

$$S(x_1, x_2, x_3) = (x_1 - 2x_2 + x_3, 5x_1 - x_2 + 3x_3, 4x_1 + x_2 + 2x_3).$$

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

Next Question

5. Let $U : \mathbf{R}^3 \rightarrow \mathbf{R}^3$ be defined by

$$U(x_1, x_2, x_3) = (x_1 + 2x_2 + 3x_3, 2x_1 + 5x_2 + 3x_3, x_1 + 8x_3).$$

- ▶ A U is one-to-one but not onto
- ▶ B U is onto but not one-to-one
- ▶ C U neither one-to-one nor onto
- ▶ D U is one-to-one and onto
- ▶ E U is onto, but Q may or may not be one-to-one.

No more questions



RIGHT!

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Wrong...try again

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