

Aljabar Linear 1 - 14 Nov - Kode Soal: B

Nama/NIM: _____

[4.3.1] What does it mean for a set of vectors to be linearly dependent?

- A. No vector in the set can be expressed as a linear combination of the others.
- B. At least one vector in the set can be expressed as a linear combination of the others.
- C. All vectors in the set are identical.
- D. The set contains only the zero vector.

[4.4.3] What is the standard basis for R^3 ?

- A. $(1, 1, 1), (0, 1, 1), (0, 0, 1)$
- B. $(1, 0, 0), (0, 1, 0), (0, 0, 1)$
- C. $(1, 0, 0), (0, 0, 0), (0, 0, 1)$
- D. $(0, 0, 0), (1, 1, 1), (2, 2, 2)$

[4.5.1] What is the dimension of a finite-dimensional vector space V ?

- A. The number of elements in the vector space itself.
- B. The number of vectors in any basis for V .
- C. The maximum number of linearly dependent vectors in V .
- D. The minimum number of vectors required to form a linearly dependent set.

[4.7.10] For the matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, which of the following is a row vector?

- A. $\begin{bmatrix} 1 \\ 3 \end{bmatrix}$
- B. $\begin{bmatrix} 1 & 2 \end{bmatrix}$
- C. $\begin{bmatrix} 3 & 1 \end{bmatrix}$
- D. $\begin{bmatrix} 2 \\ 4 \end{bmatrix}$

[4.8.6] An $m \times n$ matrix A has nullity 0. If $n = 7$, what is the rank of A ?

- A. 0
- B. 7
- C. Undefined
- D. Cannot be determined

[4.8.9] If an $m \times n$ matrix A has rank r , what is the dimension of the null space of A^T ?

- A. $n - r$
- B. $m - r$
- C. r
- D. m

[4.3.7] In R^2 , two vectors \mathbf{u} and \mathbf{v} are linearly independent if, when their initial points are at the origin, they:

- A. Lie on the same line.
- B. Are perpendicular to each other.
- C. Do not lie on the same line.
- D. Both point in the same direction.

[4.4.6] Given a basis $S = \{\mathbf{v}_1, \dots, \mathbf{v}_n\}$ and a vector $\mathbf{v} = c_1\mathbf{v}_1 + \dots + c_n\mathbf{v}_n$, what are the scalars c_1, \dots, c_n called?

- A. Components of \mathbf{v} .
- B. Magnitudes of \mathbf{v} .
- C. Coordinates of \mathbf{v} relative to the basis S .
- D. Coefficients of \mathbf{v} in V .

[4.5.7] If V is a 3-dimensional vector space, and a set S in V contains 2 vectors, what can be concluded about S ?

- A. S spans V .
- B. S is linearly independent.
- C. S does not span V .
- D. S is a basis for V .

[4.7.1] For an $m \times n$ matrix A , the vectors formed from its rows are called:

- A. Column vectors
- B. Null vectors
- C. Row vectors
- D. Basis vectors

[4.7.7] Can elementary row operations change the column space of a matrix?

- A. No, never.
- B. Yes, they always change it.
- C. Yes, they can change it, but they do not change the dependence relationships among columns.
- D. No, because they only affect rows.

[4.8.3] The rank of a matrix A can be interpreted as the number of:

- A. Rows in A .
- B. Columns in A .
- C. Leading 1's in any row echelon form of A .
- D. Zero rows in any row echelon form of A .

[4.3.4] A set with exactly two vectors, $\{\mathbf{v}_1, \mathbf{v}_2\}$, is linearly independent if and only if:

- A. $\mathbf{v}_1 = \mathbf{0}$ or $\mathbf{v}_2 = \mathbf{0}$.
- B. \mathbf{v}_1 is a scalar multiple of \mathbf{v}_2 .
- C. \mathbf{v}_2 is a scalar multiple of \mathbf{v}_1 .
- D. Neither vector is a scalar multiple of the other.

[4.7.4] A system of linear equations $A\mathbf{x} = \mathbf{b}$ is consistent if and only if:

- A. \mathbf{b} is the zero vector.
- B. \mathbf{b} is in the row space of A .
- C. \mathbf{b} is in the null space of A .
- D. \mathbf{b} is in the column space of A .

[4.5.4] What is the defined dimension of the zero vector space $V = \{\mathbf{0}\}$?

- A. 1
- B. Undefined
- C. The number of zero vectors
- D. 0