Aljabar Linear 1 - 14 Nov - Kode Soal: A

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.

[4.3.7] 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.

[4.3.4] 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.

[4.4.3] 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. $(0, 0, 0), (1, 1, 1), (2, 2, 2)$

[4.4.6] 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.

[4.5.4] 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

[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.

[4.5.7] 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.

[4.7.4] 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.

[4.7.10] 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. $\begin{bmatrix} 2 \\ 4 \end{bmatrix}$

[4.7.1] 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

[4.8.6] 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

[4.7.7] 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.

[4.8.9] 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

[4.8.3] 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.