****Linear Algebra Quiz - Medium Level****

****Instructions:** Choose the best answer for each multiple-choice question.**

1. Which of the following is NOT a property of a vector space?

A. Commutativity of vector addition

B. Associativity of vector addition

C. Existence of a zero vector

D. Existence of multiplicative inverse for each vector

Correct Answer: D

2. What is the determinant of the matrix [[2, 1], [3, 4]]?

A. 5

B. 11

C. -5

D. -1

Correct Answer: A

3. Two vectors are linearly independent if:

A. One is a scalar multiple of the other.

B. They are parallel.

C. Their dot product is zero.

D. Neither is a scalar multiple of the other.

Correct Answer: D

4. If A and B are two n x n invertible matrices, which of the following is always true?

A. (A + B)^-1 = A^-1 + B^-1

B. (AB)^-1 = A^-1 B^-1

C. (AB)^-1 = B^-1 A^-1

D. (A^T)^-1 = (A^-1)^T

Correct Answer: C

5. What is the rank of the matrix [[1, 2, 3], [4, 5, 6], [7, 8, 9]]?

A. 1

B. 2

C. 3

D. 0

Correct Answer: B