Vocabulary Review

Short-answer, multiple-choice, and select-all questions about key vocabulary.

Question 1 *A linear system of equations that has no solutions is said to be* $\boxed{inconsistent}$. *With one or more solutions, the system is* $\boxed{consistent}$.

Question 2 *Suppose in matrix E, two conditions hold:*

(a) *The first nonzero entry in each row of E is equal to 1. This leading entry 1 is called a* $\boxed{pivot}$.

(b) *A pivot in the $(i+1)^{st}$ row of E occurs in a column to the right of the column where the pivot in the i^{th} row occurs.*

The matrix is (row) $\boxed{echelon form}$. *(Hint: two words.)*

Question 3 *If an $m \times n$ matrix can be transformed into another by a sequence of elementary row operations, the two matrices are said to be* $\boxed{row equivalent}$. *(Hint: two words.)*

Question 4 *A matrix E is in* $\boxed{reduced echelon form}$ *if*

(a) *E is in echelon form, and*

(b) *in every column of E having a pivot, every entry in that column other than the pivot is 0.*

Question 5 *Let A be an $m \times n$ matrix that is row equivalent to a reduced echelon form matrix E. The number of nonzero rows in E is called the* $\boxed{rank}$ *of A.*

Author(s): Martin Golubitsky

Question 6 *A mapping* $L : \mathbb{R}^n \to \mathbb{R}^m$ *is* $\boxed{linear}$ *if*

(a) $L(x + y) = \boxed{L(x) + L(y)}$ *for all* $x, y \in \mathbb{R}^n$.

(b) $L(cx) = \boxed{cL(x)}$ *for all* $x \in \mathbb{R}^n$ *and all scalars* $c \in \mathbb{R}$.

Question 7 *Let* j *be an integer between* 1 *and* n. *The* n*-vector* e_j *is the vector that has a* $\boxed{1}$ *in the* j^{th} *entry and a* $\boxed{0}$ *in every other entry.*

Question 8 *Given an* $n \times n$ *matrix* A*, if there is an* $n \times n$ *matrix* B *such that* $AB = I_n$ *and* $BA = I_n$*, then* A *is said to be* $\boxed{invertible}$*, and the matrix* B *is called the* $\boxed{inverse}$ *of* A*. If there is no such matrix* B*, the* A *is said to be* $\boxed{singular}$*, or noninvertible.*

Question 9 *If* $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$*, then the determinant of* A*,* $det(A) = \boxed{ad - bc}$.
