Vocabulary Review

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

Question 1 *A linear system of equations is* $\boxed{inconsistent}$ *if the system has no solutions and* $\boxed{consistent}$ *if the system does have solutions.*

Question 2 *A matrix E is in (row)* $\boxed{echelonform}$ *if 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.*

Note: A consequence of this definition is that all rows in an echelon form matrix that are identically zero occur at the bottom of the matrix.

Question 3 *Two $m \times n$ matrices are* $\boxed{rowequivalent}$ *if one can be transformed to the other by a sequence of elementary row operations.*

Question 4 *A matrix E is in* $\boxed{reducedechelonform}$ *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. Then the* $\boxed{rank}$ *of A is the number of nonzero rows in E.*

Learning outcomes:
Author(s): Martin Golubitsky

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

Question 8 *The $n \times n$ matrix A is invertible if there is an $n \times n$ matrix B such that $AB = I_n$ and $BA = I_n$. The matrix B is called an* $\boxed{\textit{inverse}}$ *of A. If A is not invertible, then A is noninvertible or* $\boxed{\textit{singular}}$.

Question 9 *The determinant of the 2×2 matrix $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is $det(A) =$* $\boxed{ad - bc}$.
