Name: _____ **Quiz 3**

Math 362 Linear Algebra – Crawford **24 October 2018**

Books, notes (in any form), and calculators are not are allowed. Show all other work for credit. ***Good luck!*** [Note: Each quiz score will be scaled to 15 points after grading.]

1. (7 pts) Given the system $\begin{array}{rcrcl} 2sx_1 & + & 3x_2 & = & 4 \\ 6x_1 & + & sx_2 & = & 2 \end{array}$, which contains the parameter s,

(a). Determine the value(s) of s for which the system has a unique solution.

(b). Use Cramer's Rule to find the solution.

2. (4 pts) Determine whether the following statements are true or false.

(a). If A is invertible, then the columns of A^{-1} are linearly independent.

(b). If $n \times n$ matrices satisfy the property that $EF = I$, then E and F commute.

(c). If A is an $n \times n$ matrix such that $A\mathbf{x} = \mathbf{b}$ has at least one solution for each $\mathbf{b}$ in $\mathbb{R}^n$, then the solution is unique for each $\mathbf{b}$.

(d). Suppose A is a $n \times n$ matrix with $\det A = 1$. If the entries in A are integers, then the entries in A^{-1} are integers.

3. (4 pts) Let $T : \mathbb{R}^n \to \mathbb{R}^n$ be a linear transformation. If $T(\mathbf{u}) = T(\mathbf{v})$ for a pair of distinct vectors $\mathbf{u}$ and $\mathbf{v}$, prove that T is not onto $\mathbb{R}^n$.