Math 54 Quiz 3 Name: ______________________________
GSI: Jeremy Meza
February 12, 2019

1. Mark each statement as True or False. You **must** justify your answer. *(2 points each).*

   (a) If there is a $n \times n$ matrix C such that $CA = I$, then A has n pivot positions.

   (b) If A, B, C are $n \times n$ matrices such that $AB = AC$, then $B = C$.

2. Let T be the linear transformation $\mathbb{R}^2 \to \mathbb{R}^3$ with $T(\mathbf{e}_1) = \begin{pmatrix} 2 \\ 3 \\ -1 \end{pmatrix}$ and $T(\mathbf{e}_2) = \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix}$.

   (a) Find the matrix of T. *(1 point).*

   (b) Is T one-to-one, onto, both, or neither? You **must** explain. *(2 points).*

   (c) Suppose $S : \mathbb{R}^3 \to \mathbb{R}^3$ is the linear transformation that reflects vectors across the yz-plane. Find the matrices of S and $S \circ T$. *(3 points).*