Quiz 2
MATH 2184-10 - Linear Algebra
Summer 2017

Total Points: 30   **Total Time:** 20 minutes

Name: _____   **Date:** 2017-06-05

Read all of the following information before starting the quiz:

- Show all work, clearly and in order, to get full credit.
- Do not use calculators.
- Circle or otherwise indicate your final answers.

1. Let M be the standard matrix for the linear transformation $T : \mathbb{R}^2 \to \mathbb{R}^2$ which takes the vector e_2 to $e_1 + 2e_2$ and keeps e_1 unchanged. Then, [5]

$$M = \begin{bmatrix} & \\ & \end{bmatrix}.$$

2. Find $(AB)^{-1}$ (if exists) where [10]

$$A = \begin{bmatrix} 1 & -1 & 2 \\ 1 & 2 & -3 \end{bmatrix}, \ B = \begin{bmatrix} 1 & -1 \\ 0 & 2 \\ 1 & 1 \end{bmatrix}.$$

3. For what value(s) of a is $\det(A + B) = \det(A) + \det(B)$ where [10]

$$A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, B = \begin{bmatrix} a & b \\ c & -a^2 \end{bmatrix}?$$

4. Let $T : \mathbb{R}^n \to \mathbb{R}^m$ be a linear transformation and $v_1, v_2, v_3 \in \mathbb{R}^n$.
   Show that the set $\{v_1, v_2, v_3\}$ is linearly independent if $\{T(v_1), T(v_2), T(v_3)\}$ is linearly independent. [5]