Math 3A   **Name (Print):** _____
Spring 2016
Quiz 7
05/10/2016
Time Limit: 20 Minutes   Student ID _____

This exam contains 4 pages (including this cover page) and 1 problems. Check to see if any pages are missing. Enter all requested information on the top of this page, and put your initials on the top of every page, in case the pages become separated.

You may *not* use your books, notes, or any calculator on this exam.

You are required to show your work on each problem on this exam. The following rules apply:

- **If you use a "theorem" you must indicate this** and explain why the theorem may be applied.

- **Organize your work**, in a reasonably neat and coherent way, in the space provided. Work scattered all over the page without a clear ordering will receive very little credit.

- **Mysterious or unsupported answers will not receive full credit**. A correct answer, unsupported by calculations, explanation, or algebraic work will receive no credit; an incorrect answer supported by substantially correct calculations and explanations might still receive partial credit.

- If you need more space, use the back of the pages; clearly indicate when you have done this.

Do not write in the table to the right.

Problem	Points	Score
1	35	
Total:	35	

1. For $c \in \mathbb{R}$, we define the matrix $\mathbf{A_c} \in \mathbb{R}^{3\times3}$ by

$$\mathbf{A_c} = \begin{bmatrix} 1 & -1 & 1 \\ 2 & 2 & c \\ 3c & c & 2c \end{bmatrix}. \tag{1}$$

(a) (5 points) Compute $det(\mathbf{A_c})$. (**Hint:** You may want to use the properties of the determinant and row operations to simplify the computation.)

(b) (5 points) For which c is the matrix $\mathbf{A_c}$ invertible? (**Hint:** You may need to satisfy more than one constraint.)

(c) (5 points) Compute $det(\mathbf{A_c}^2)$.

(d) (5 points) Compute $det(5\mathbf{A_c})$.

(e) (5 points) Compute $det(\mathbf{E_k}\mathbf{A_c})$, where

$$\mathbf{E}_k = \begin{bmatrix} 1 & 0 & 0 \\ k & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}. \tag{2}$$

(f) (5 points) Compute $det(\mathbf{D_k A_c})$, where

$$\mathbf{D}_k = \begin{bmatrix} 1 & 0 & 0 \\ 0 & k & 0 \\ 0 & 0 & 1 \end{bmatrix}. \tag{3}$$

(g) (5 points) Compute $det(\mathbf{A_2}^{-1})$.