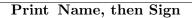
### Proof M-1

# Accepted

# Not Accepted

I affirm this work abides by the university's Academic Honesty Policy.



- First due date Thursday, October 23.
- Turn in the the final version of your work on a separate sheet of paper with this page stapled in front.
- Do not include scratch work in your submission.
- Follow the Writing Guidelines of the Grading Rubric. (http://math.ups.edu/~bryans/Current/Fall\_2008/290inf\_Fall2008.html#tth\_sEc5.1)
- Retry: Only use material from the relevant section or earlier.
- Retry: Start over using a new sheet of paper.
- Retry: Restaple with new attempts first and this page on top.

"Often you must turn your stylus to erase, if you hope to write anything worth a second reading". -Horace, poet and satirist (65-8 BCE)

## M-1 (Section MISLE)

- 1. Given an  $m \times n$  matrix A and an  $n \times m$  matrix B where m > n, prove that it is impossible to have the product  $AB = I_m$ .
- 2. Show that the order of multiplication is important by finding a specific  $6 \times 4$  matrix A and a specific  $4 \times 6$  matrix B where  $BA = I_4$ .
- 3. For bonus points, generalize your answer in part 2. That is, prove that for any positive integers m and n with m > n, then there is an  $m \times n$  matrix A and an  $n \times m$  matrix B with  $BA = I_n$ .

### Notes:

- These matrices are not square so don't use results that require square matrices.
- One way to approach part 1 is to think about null spaces.
- For parts 2 and 3, consider  $\begin{bmatrix} 2 & 0 \end{bmatrix} \begin{bmatrix} \frac{1}{2} \\ 0 \end{bmatrix} = \begin{bmatrix} 1 \end{bmatrix} = I_1$