Smith **Math 290** **Spring 2014**

Proof V-1

Accepted **Not Accepted**

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

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Print Name, then Sign

- First due date **Thursday, February** 27.
- Turn in your work on a separate sheet of paper with this page stapled in front.
- Do not include scratch work in your submission.
- There is to be **no collaboration** on any aspect of developing and presenting your proof. Your only resources are: you, the course textbook, me, and pertinent discussions that occur **during class.**
- Follow the Writing Guidelines of the Grading Rubric in the course information sheet.
- Retry: Only use material from the relevant section of the text or earlier.
- Retry: Start over using a new sheet of paper.
- Retry: Restaple with new attempts first and this page on top.

"'Know thyself?' If I knew myself, I'd run away." – Johann von Goethe

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V-2 (**Use only material up to and including Section O**) Prove both of the following Theorems. The following two results (especially the first) might seem simple but they provide an excellent opportunity to learn how to correctly present a proof involving linear independence. So make sure to focus on the using correct notation to present the details.

Theorem 1 *(Contract) Suppose* $n \geq 2$ *and that* $S = \{\vec{v}_1, \vec{v}_2, \cdots, \vec{v}_{n-1}, \vec{v}_n\}$ *is a linearly independent set of vectors. Then* $T = \{\vec{v}_1, \vec{v}_2, \cdots, \vec{v}_{n-1}\}$ *is also linearly independent.*

Theorem 2 *(Expand) Suppose* $S = \{\vec{v}_1, \vec{v}_2, \cdots, \vec{v}_{n-1}, \vec{v}_n\}$ *is a linearly independent set of vectors and that* $\vec{z} \notin \langle S \rangle$*. Then* $W = \{\vec{v}_1, \vec{v}_2, \cdots, \vec{v}_{n-1}, \vec{v}_n,\ \vec{z}\}$ *is also linearly independent.*

[These theorems are the keys to building larger (or smaller) linearly independent sets.]
