Smith **Math 290** **Fall 2009**

Proof LT-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, December** 3.
- *** You **may** discuss this problem with others but may not discuss how to write it up or show others your written work.
- Turn in 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_2009/290inf_Fall2009.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.

"There was more imagination in the head of Archimedes than in that of Homer." – Voltaire

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LT-1 (You may use material up through Section IVLT)

1. Prove that the function $T : P_2 \to \mathbf{C}^3$ given by

$$T(p) = \begin{bmatrix} p(0) \\ p'(1) \\ p(2) \end{bmatrix}$$

   is a linear transformation.

2. Determine the the kernel and range of T, express them as spans of linearly independent sets and use them to determine if T is injective, surjective or an isomorphism.
