Bi-conditional Statement Pre-class assignment
INSERT YOUR NAME HERE

Complete the following proof. Print your compiled document and bring it to class.

1. Let A be an invertible matrix. Prove that $A^2 = A$ if and only if $A = I$.

   Proof. Let A be an invertible matrix.

   ($\Rightarrow$) Assume that $A^2 = A$. Theorem 2.4 says that $AI = A$. Moreover by definition of matrix powers, $A^2 = AA$. Rewriting the original equality using this information, we see

   $$AA = AI.$$

   Since A is invertible, we can use left cancellation, Theorem 2.10, to conclude $A = I$.
   ($\Leftarrow$) Assume that $A = I$. .....

   (Yes this direction will be very straightforward.)

   □

Some information about using LaTeX (pronounced "Lah-Tech" or "Lay-Tech" depending on who you ask).

- Any mathematical symbols will go between `$ ... $`.
- To display an equation on its own line use `$$ ... $$`.
- To get a newline, use either \\ or skip two lines in the editor. The first option will simply skip to the next line, the second option will create a new paragraph.
- To get superscripts, use a carrot: `$A^{123}$`, and for subscripts, an underscore: `$x_{ij}$`.
- Many standard functions and characters exist as commands, for example $\cos(2\pi)$ is produced using `$\cos(2\pi)$`.
- To make a matrix, such as $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$, use
  `$A=\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$`.
  Here the `&` indicates an alignment and `\\` gives a new line.
- You will be required to learn how to use this text editor for homework. It will make proof-writing much easier and your future-selves much happier.
- Don't hesitate to ask if you have any questions.