

**Linear Algebra**  
**MATH 224W – Spring 2015**

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Week 4: logic and proof methods

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**Writing Assignment #3**

**due Monday, Sept. 14**

§1.5 #22(b), 50, 51, 53

**All** of your proofs for §1.5 should be **matrix-level** and not entry-level. Make use of the theorems in sections 1.4 and 1.5! Each of the write-ups should be quite short, but **make sure to cite** all of the theorems that you are using.

AP #1 Prove Theorem 1.2(b).

You will probably have to work with the entries of the matrix and make use of summation notation properties.

AP #2 Show that if  $A$  is an  $n \times n$  matrix with a column of zeros, then  $A$  is not invertible.

*Hint:* argue by contradiction. Assume  $A$  is invertible. Then there must be an  $n \times n$  matrix  $B$  such that  $BA = I$ . Now explain why this is impossible by using a result you proved on the previous writing assignment.

**Homework #3**

**due Thursday, Sept. 17**

§1.5 #31, 32, 33(a), 36, 38

§1.6 #4, 6, 8, 10, 12, 16, 19

For #19(c), the “ $T(u)$ ” may be confusing. You want to find the smallest positive  $k$  such that  $A^k \mathbf{u} = \mathbf{u}$  for all  $\mathbf{u} \in R^2$ .