Linear Algebra
MATH 224W – Spring 2015

Week 8: Vector Spaces

Writing Assignment #7 **due Monday, Oct. 19**

§3.2 #10, 11, 15(a)
Aim for short, concise proofs.

§4.2 #24

AP #1 Prove that if $A \in M_{n\times n}$ and every entry of A is a rational number, then $\det A$ is also a rational number. *Hint: try using the* ***definition*** *of the determinant. It is quite possible that your proof will be very short.*

AP #2 Let n be an *odd* positive integer. Prove that if $A \in M_{n\times n}$ and $A^2 = 2I_n$, then some entry in A is an irrational number.

Homework #7 **due Wednesday, Oct. 14**

§3.2 #8, 9, 24(a), 26(b)
For #8, and 9 make sure to cite any results you use.

§3.3 #3, 4, 12

AP #1 Compute the following determinants using cofactor expansion (Theorem 3.10). *Hint: start your expansion along a row or column that has many zero entries.*

(a)
$$\begin{vmatrix} 1 & 0 & 3 & 0 \\ 2 & 1 & -4 & -1 \\ 3 & 2 & 4 & 0 \\ 0 & 3 & -1 & 0 \end{vmatrix}$$

(b)
$$\begin{vmatrix} -1 & 0 & 0 & -2 \\ 5 & 6 & 7 & 8 \\ 0 & -7 & 0 & 0 \\ 0 & 3 & -1 & 5 \end{vmatrix}$$