#3, Due Monday 08/22 at 6pm

Last updated on 08/15/2016

Part 1

Section 4.3: 10, 11, 12

Section 5.1: 1(a)(b)(d)(e)(f)(i)(j)(k), 3(a)(b)(c),4(f),8(a)(b),17(a)(b)(c)

Section 5.2: 1(a)-(g)(All of them!), 2(a),3(a),20

Section 5.4: 1(a)(f)(Hint: See Section 4.3, Exercise 24), 2(a)(c)(e), 18(a)(b)(c)

Section 7.1: 3(a)(c) (You only need to find the Jordan canonical form of T in (a) and (c))

Section 7.2: 1(a)(d)(g), ~~3(a)-(e)(All of them!)~~, 3(a)(c)(d)(e)

Part 2

1. Prove that for any $A, B \in M_{n\times n}(F)$, AB and BA have the same eigenvalues. More precisely, for any $\lambda \in F$, λ is an eigenvalue of AB if and only if λ is an eigenvalue of BA.

2. $T : V \to V$ is a linear transformation, $x \in V$ such that $T^{k-1}(x) \neq 0, T^k(x) = 0$. Prove that $\beta = \{x, Tx, T^2(x), \cdots, T^{k-1}(x)\}$ is linearly independent. Let $W = \text{Span}\beta$, then W is a T-invariant subspace, what is $[T|_W]_\beta$?

3. Find an explicit formula for a_n where a_n is defined by

$$a_1 = a_2 = 1$$

and

$$a_n = a_{n-1} + a_{n-2}$$

for $n \geq 3$.