Math 132
Winter 2017

UPDATED GENERAL INFORMATION — MARCH 3, 2017

Class meeting on Friday, March 10

There were verbal cancellation notices for this class, **BUT TODAY THERE WAS A CHANGE IN SCHEDULING** and therefore there **WILL BE** a regular meeting of class that day, almost certainly devoted to review questions.

The third quiz

Here are some practice questions. As in the handwritten notes, the characteristic and minimal polynomials for a linear transformation $T : V \to V$ are denoted by $\chi_T(z)$ and $m_T(z)$ respectively. Also, the *geometric multiplicity* of an eigenvalue λ for T is equal to the dimension of the subspace W_λ of all vectors x such that $Tx = \lambda\, x$. Equivalently, this is also the number of elementary Jordan blocks in the Jordan form for which the diagonal entries are given by λ (why?). For each of the exercises below, determine the possibilities for the Jordan form which are consistent with the given data.

1. $\chi_T(z) = (z-2)^3(z-3)^2$.

2. $\chi_T(z) = (z-3)^4(z-5)^4$, $m_T(z) = (z-3)^2(z-5)^2$.

3. $\chi_T(z) = (z-3)^4(z-8)^2$, where the geometric multiplicities of 3 and 8 are 2 and 1 respectively.

4. $\chi_T(z) = (z-7)^5$, where the geometric multiplicity of 7 is 3.

5. $\chi_T(z)$ is a polynomial of degree 6, and $m_T(z) = (z-1)^4(z-4)$.