Due: Wednesday, March 11, 2015 at 1am.

All numbered problems are from Dummit and Foote, Third Ed.
All problems will be graded. Show all work to receive full credit.

Read Ch. 11 section 3; Ch. 12 section 3 of the textbook.

• From section 12.3: 4, 16, 18, 25, 26.

• Let $V$ be an $n$-dimensional vector space of $F$, and write $V^* = \text{Hom}_F(V,F)$.
  Let $f : V \to V$ be an $F$-linear endomorphism of $V$. Prove that
  (1) $f^*(\phi) = \phi \circ f$ defines an $F$-linear endomorphism $f^*$ of $V^*$.
  (2) the minimal and characteristic polynomials of $f$ and $f^*$ are the same.
  (3) the two $F[x]$-modules $(V,f)$ and $(V^*,f^*)$ are isomorphic.
     (Hint: prove that they have the same invariant factors / elementary divisors).