Math 323, Homework 8, Due Tuesday March 18.

1. Let F be a field, and V_1, V_2 be finite-dimensional F-vector spaces. Prove that the $F[x]$-module (V_1, T_1) is isomorphic to the $F[x]$-module (V_2, T_2) if and only if $\dim V_1 = \dim V_2$ and there exists a basis $\{\bar{e}_1, \ldots, \bar{e}_n\}$ of V_1 and a basis $\{\bar{w}_1, \ldots \bar{w}_n\}$ of V_2 such that the matrix of T_1 with respect to the basis $\{\bar{e}_i\}$ coincides with the matrix of T_2 with respect to the basis $\{\bar{w}_i\}$.

Section 10.1: Problems 7, 8, 9, 10, 11, 20.

Section 10.2: Problems 4, 6, 8.