Introduction to knot theory, Spring 2013

Homework 4, due Thursday, February 21

Read sections 10.1-10.3 of Dummit and Foote.

1. Let M_1, M_2 be submodules of an R-module M. Show that $M_1 + M_2$ and $M_1 \cap M_2$ are submodules of M. Give an example of R, M, M_1, M_2 such that $M_1 \cap M_2 = 0$ and $M_1 + M_2 = M$.

Exercises 4, 10, 14, 18 from Section 10.1 (pages 343-344).

Exercise 3 from Section 10.2 (page 350).

Extra credit:
I. Exercise 2 from Section 10.3 (page 356)

II. Give an example of a ring R, module M and its submodule N such that M/N and N are isomorphic irreducible R-modules.