

## Homework 1

Due Wednesday January 21, 2009 at the beginning of class.

Please write your home work neatly and use dark ink or a dark pencil. Please write in complete sentences. If you do something clever, you might want to give me a hint about what you are doing. If you want to replace some of the problems I have assigned with something more interesting, that is fine with me.

- (1) Page 8, problem 1.4. This is a combinatorics problem. We will use the result many times.
- (2) Page 8, problem 1.5. This result was promised in the text (and in my lecture).
- (3) Page 8, problem 1.8. This result was promised in the text (and in my lecture).
- (4) Page 8, problem 1.11. This problem is the key step in the proof of Proposition 1.15. Do notice the typo in the proof of Proposition 1.15. The linear transformation  $\phi^* : P_{n,d} \rightarrow P_{n,d}$  satisfies

$$(\phi^* f)(x_1, \dots, x_n) = (f \circ \phi)(x_1, \dots, x_n).$$

*This is not what is written in the text book.*

- (5) If possible, prove the assertion of part 3 of Example 1.9 on page 4. (I do not know how hard this problem is. Maybe we can't do it until later in the course. At any rate, keep the problem in your mind and do it when you are able.)
- (6) If possible, prove the assertion of part 4 of Example 1.9 on page 4. (I do not know how hard this problem is. Maybe we can't do it until later in the course. At any rate, keep the problem in your mind and do it when you are able.)