MATEMATISKA INSTITUTIONEN
STOCKHOLMS UNIVERSITET

Kommutativ algebra
HT 2003

Avd. Matematik
Jörgen Backelin

Some general comments: If you cannot solve the full exercise, you may solve it in some special cases, to begin with. However, you should note which cases your solution covers.

If I'm not satisfied, you may get a chance to make improvements, and re-deliver the results.

Cooperation is encouraged! (However, be sure to be able to answer for your own set of delivered results.)

The first round consists of the following exercises from Atiyah-Macdonald: 1.4, 1.12, 1.14, 1.17, 1.19, 1.21, 1.27 (*except*, of course, the surjectivity, being essentially the Nullstellensats), 2.4, 2.8, 2.9, 2.15, 2.19.

Of these, some are simple "Verify that" exercises. However, some require knowledge beyond the text proper. You are encouraged to acquire such knowledge by working through more exercises; e.g., in the block about the prime spectrum of a ring (at least, do exercises 1.14 to 1.19), and the one about direct limits (2.14 to 2.19).

If the solution of one exercise depends on the results of a former (not listed) one, you should refer explicitly to that former exercise, but you do not need to provide the proofs of such statements.

If you find notation or concepts that are not defined in the book, feel free to ask each others or me what they might mean.
E.g., in exercise 1.21 iii), $\overline{M}$ denotes the closure of a subset M of a topological set (in this case the set X). From general (point set) topology, some properties of closures follow; and such 'well known' properties may be used without proof. (Thus, you do not have to prove that $\overline{M} = \bigcap_{V} V$, the intersection being taken over all closed sets containing M as a subset, even if you should use this fact.)