

Faculty of Science and Engineering

Dept. of Mathematics and Statistics

MATH1090. Problem Set No4

Posted: Nov. 18, 2007

Due: Dec. 5, 2007; in the course assignment box, by 2pm.



It is worth remembering (from the course outline):

The homework must be each individual's own work. While consultations with the instructor, tutor, and among students, are part of the learning process and are encouraged, *at the end of all this consultation* each student will have to produce an individual report rather than a copy (full or partial) of somebody else's report.

The concept of "late assignments" does not exist in this course.



A terse but full annotation of each proof step is required! In what follows, "prove $\vdash A$ " means give a proof of A in *any* of the styles we have learnt —Hilbert, equational, resolution, by-Post, etc. **unless a particular methodology is requested**. Corresponding comment holds for "prove $\Gamma \vdash A$ ": Prove A from assumptions Γ .

Important. If in any problem where you use a technique different than the one requested, then your maximum points will be 2.

Appropriate annotation is always required!

Do the following problems from the text —each has max 5 MARKS.

- (1) Section 6.6: Problems 2, 3, 4, 5, 8, 11, 17, 20, 24, 25, 34.
- (2) Prove *using the "auxiliary variable metatheorem"*:
 $\vdash (\exists \mathbf{x})B \rightarrow (\exists \mathbf{x})(A \rightarrow B)$.
- (3) Do Exercise 8.2.11.
- (4) Do Exercise 2 of Section 8.3.