Mathematics 321
Homework Assignments

Homework Assignment 4
Due: Friday, February 9.

Part I. Work exercises §1.3 # 13, §1.4 # 3 and 4

Part II. Consider the following Axiomatic System:

Undefined Terms: point, line, lie on

Axioms:
A1. For every point $P$ and for every point $Q \neq P$ there exists a unique line $\ell$ such that both $P$ and $Q$ lie on $\ell$.
A2. For every line $\ell$ there exist at least two distinct points that lie on $\ell$.
A3. There exist three distinct points that do not lie on the same line.

Prove the following theorems in this system.

Theorem 1. For every line $\ell$ there is at least one point $P$ such that $P$ does not lie on $\ell$.

Theorem 2. For every point $P$ there is at least one line $\ell$ such that $P$ does not lie on $\ell$.

Note: Homework assignments for this course are also available on the web at http://www.calvin.edu/~venema/m321.html.