

# PMAT 613 L01 Fall 2009

## Assignment 1

Questions taken from the text by I. Stewart (3rd Edition) will be specified by page and number. Due Oct 2, 2009.

1. Show that a ring with no non-trivial ideals is a field.
2. Show that a finite integral domain is a field.
3. 16.4
4. Find an irreducible polynomial
  - (a) of degree 3 over  $\mathbb{Z}_2$ ,
  - (b) of degree 2 over  $\mathbb{Z}_3$ .
5. 16.8 (remember that monomorphism as used by Stewart means injective)
6. Any homomorphism  $f : K \rightarrow L$  of fields is injective.
7. 16.11, and if false give a counterexample.
8. Find a field  $K$  with 9 elements. You can exhibit it via addition and multiplication tables, or by a construction using polynomials, or otherwise.