MATH 340 Assignment 8, Fall 2007

Michael Monagan

This assignment is due Monday December 3rd at the beginning of class.
For problems requiring Maple please submit a printout of a Maple worksheet.
Late penalty: -20% for up to 24 hours late. Zero after that.

Section 2.12: Isomorphisms Between (finite) Fields

Exercises 1, 6(i) and prove Lemma 2.12.1 part (ii).

For exercise 1, factor the polynomial $f(x) = x^3 + x + 1$ over F and over G.

Section 2.14: Error Correcting Codes

Exercises 1, 4, 6, 8, 10.

Use Maple to do the arithmetic in exercise 8.

Section 3.1: Basic Properties (of Groups)

Exercises 1, 5, 7(iii), 8, 9, 12, 18.
Also, find the isomorphism between the group $\mathbb{Z}_4(+)$ and the group $Q(\times)$ where

$$Q = \{1, -1, i, -i\} \ \ \text{and} \ \ i^2 = -1.$$

For exercise 18, determine the order of each element of D_3.