

Math 75 – Homework #5

posted May 4, 2008; due Monday, May 5, 2008

Exercises Do problems 4.1, 4.3, 4.4, 4.6, 4.7, 5.1, 5.2, 5.4, and 5.5 in the book.

Here are some comments:

In problem 4.1 note that a “coset leader” is a representative of its coset that has minimal weight; it is not necessarily unique.

In problem 4.3, change “rows” to “columns”.

In problem 4.4, change the matrix to its transpose.

In problem 4.7, do the binary case as stated. Note that since Exercise 3.18 was never assigned, your answer here should include a solution to Exercise 3.18. For the ternary case, rather than writing out the entire $3^4 = 81$ row-table, find coset leaders for the following 10 syndromes: $(1, -1, 1, 0)$, $(1, 1, 1, 0)$, $(0, 0, -1, -1)$, $(-1, -1, 1, -1)$, $(-1, -1, 0, -1)$, $(0, -1, 1, 1)$, $(1, 1, -1, 1)$, $(1, -1, 1, 1)$, $(1, 0, 0, -1)$, $(0, -1, -1, 0)$. You may ignore the ternary case of 3.17 and 3.18.

For problem 5.5, you should read in the book what a perfect code is.