Math 75 – Homework #5

posted April 23, 2008; due Monday, April 28, 2008

Exercises

1. In class we indicated that a code can correct all patterns of at most t errors if and only if the minimum distance of the code is at least $2t+1$. We proved the 'if' portion; prove the 'only if' portion. (This is worked out in §2.5 of the text, but explain your proof in your own words.)

2. Exercise 3.7 from Chapter 3, p. 44.

3. Exercise 3.8.

4. Exercise 3.10. (Here if u is the sent word and v the received word, by the *error pattern* we mean the word $v - u$.)

5. Exercise 3.16.

6. Exercise 3.17.

7. Exercise 3.19.

8. Construct a check matrix for the (9,3) triple repetition code over $\mathbb{F}_2$. (This is the code where the encoder sends (a, b, c) in $\mathbb{F}_2^3$ to $(a, a, a, b, b, b, c, c, c)$ in $\mathbb{F}_2^9$.)