

CODING THEORY, MATH 567
PROBLEM SET 1
DUE: FRIDAY JANUARY 23

- (1) a) Do §1.1, Exercise 2.
b) Do §1.1, Exercise 8.
- (2) Do §1.1, Exercise 12.
- (3) Do §1.1, Exercise 18.
- (4) Do §1.2, Exercise 8.
- (5) Do §1.2, Exercise 9. Note: If X is a random variable with range $\{x_1, x_2, \dots, x_n\}$ and

$$f : \{x_1, x_2, \dots, x_n\} \rightarrow \{y_1, y_2, \dots, y_m\}$$

is a map, then $Y = f(X)$ is a random variable with range $\{y_1, y_2, \dots, y_m\}$ such that

$$P(Y = y_i) = \sum_{j: f(x_j)=y_i} P(X = x_j).$$

for all i . (Whenever X has outcome x_j , then Y has outcome $f(x_j)$.)

- (6) Do §1.2, Exercise 10 (use convexity).