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 \(\{x_1, x_2, \ldots, x_n\}\) and
   \[f : \{x_1, x_2, \ldots, x_n\} \to \{y_1, y_2, \ldots, y_m\}\]
   is a map, then \(Y = f(X)\) is a random variable with range \(\{y_1, y_2, \ldots, y_m\}\) 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).