

MATH 636, Fall 2014
HOMEWORK 1
due 5:00PM on Tuesday, September 9.

Background reading: Combinatorics: A Guided Tour, Sections 1.1 and 1.2.

Follow the posted homework guidelines when completing this assignment.

In particular, remember that you must fully justify any assertions you make.

Only consult with your classmates or professor to discuss the problem set.

Solutions to these problems should be typed (or written neatly) and handed in as class starts on Tuesday 9/9:

- 1-1.** (ab) 1.1.2ab (This means parts a and b in Problem 2 of Section 1.1)
- (c) And: Assuming that the coin is fair, what is the probability that a sequence of 20 flips has exactly 10 heads and 10 tails (in any order)?
- 1-2.** How many orderings are there for a deck of 52 cards if all the cards of the same suit are together?
- 1-3.** (a) 1.1.5
- (b) Consider all ways to choose fifteen coins and the amount of money each way represents. (For example, 15 dimes equals \$1.50.) What is the smallest amount of money that occurs in at least two different ways?
- 1-4.** (a) How many subsets of $[30]$ contain no prime numbers?
- (b) How many subsets of $[30]$ have size 15 and no numbers larger than 20?
- (c) How many multisubsets of $[30]$ of size 13 have smallest element 6 and largest element 17?
- 1-5.** 1.2.9