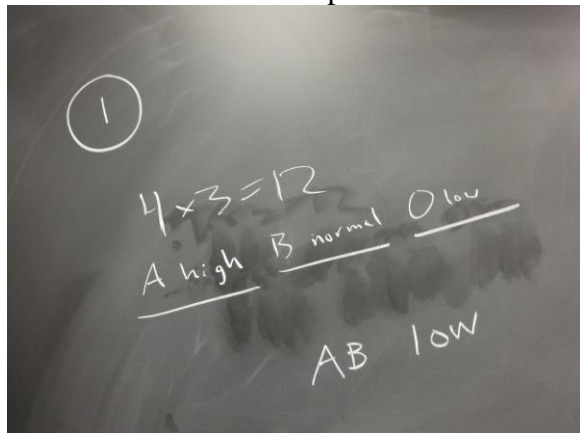
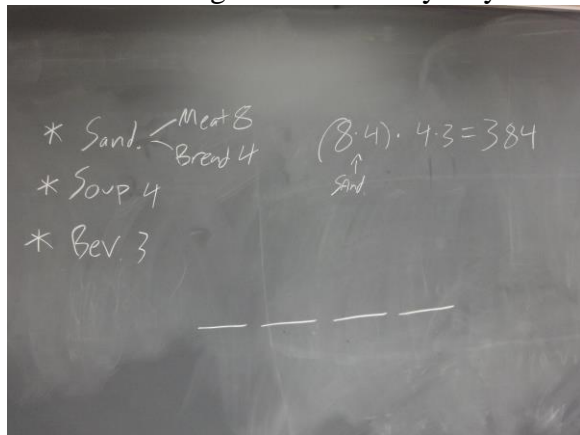


MATH 126
Counting Techniques

1. In a medical study, patients are classified according to their blood type (A, B, AB, and O) and whether their blood pressure is low, normal, or high. In how many different ways can a patient be classified? Give examples of three different classifications.



2. A diner is offering a special deal consisting of a sandwich, soup, and beverage. There are eight meats to choose from, four different types of bread, four different types of soup, and three different beverages. In how many ways can a person choose one of these special meals?

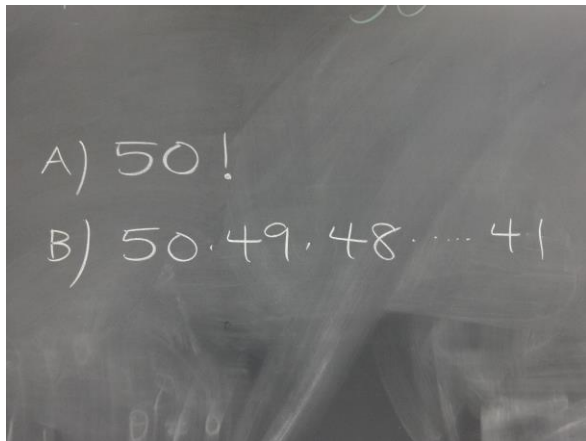


3. A multiple-choice test consists of 15 questions; each question has options A through D.
 (a) How many different response sheets are possible?
 (b) How many of the response sheets in (a) have all wrong answers?

(a) $\underbrace{4 \cdot 4 \cdot 4 \cdots 4}_{15 \text{ factors}} = 4^{15} = 1,073,741,824$

(b) $\underbrace{3 \cdot 3 \cdot 3 \cdots 3}_{15 \text{ factors}} = 3^{15} = 14,348,907$ (Note that if each question has one correct response, then this means there are 3 *incorrect* responses.)

4. A presidential candidate plans to visit the capital of each of the 50 states. In how many ways is this possible? Follow up: How would this be different if s/he is visiting only 10 capitals? How is the solution modified?



Note: (a) $50! \approx 3.04 \times 10^{64}$
 (b) $50 \cdot 49 \cdot 48 \cdot 47 \cdot 46 \cdot 45 \cdot 44 \cdot 43 \cdot 42 \cdot 41 \approx 3.7 \times 10^{16}$

5. Standard RI license plates look like this:



- (a) If the style above is followed, how many unique plates are possible?
- (b) What if no letters are repeated?
- (c) How about no letters nor numbers repeated?

