

Name: \_\_\_\_\_ Section (circle one): 9 am      10 am

Math 461, Sections B/C, Spring 2009  
HW Assignment 4, due Monday, 2/23/2009

### Instructions

- **Write your name on the cover sheet and staple the sheet to the assignment.** Do the problems in order, and make sure that each problem is clearly labelled. The assignment is due **in class** on the above due date. **Late homework, or homework dropped off in mailboxes, will not be accepted.** (You can, however, turn in the homework early, in my office, 241 Illini Hall, at any day before the due date.) If you cannot turn in an assignment on time, but have a legitimate excuse (e.g., illness), with appropriate documentation, the assignment will be marked as “excused”; see the Course Information Sheet handed out at the beginning of class for details.

### HW 4 Problems (pp. 111–124)

All problems are from the Problems Section at the end of Chapter 3. Most are Bayes’ type problems, or two stage problems (like the three coin problem). You should work these problems rigorously, following the model of the examples worked in class and in the book. For most problems (and, in particular, for Bayes’ type problems) this means:

- Identify the events in question and introduce appropriate notation for them (e.g.,  $D$  = “has disease”,  $P$  = “tests positive”).
- Translate the *given* data (probabilities) into this notation (e.g.,  $P(P|D^c) = 0.02$ , etc.). Similarly, translate the probability we want to find into this notation (e.g., “we want  $P(D|P)$ ”).
- Finally, using appropriate formulas (e.g., Bayes’ or the Average Rule) derive the probability we want to find from the probabilities we are given.

The final problem is from the “Theoretical Exercises” section; it’s an easy exercise in using the definition of a conditional probability.

1. #2
2. #5
3. #15
4. #17
5. #18
6. #21
7. #30
8. #38
9. #45
10. #64(a)(b) (For each part, work out winning probability.)
11. #T2 (Theoretical Exercise 2, p. 124)