Statistics for the Life Sciences
Math 20340 Section 01, Fall 2009
Homework 1 Solutions

• 4.1:
  – a: Simple events 1, 2, 3, 4, 5, 6
  – b: A: {2}; B: {2, 4, 6}; C: {3, 4, 5, 6}; D: {2}; E: {2, 4, 6}; F: ∅
  – c: Each one should have probability 1/6
  – d: A: 1/6; B: 1/2; C: 2/3; D: 1/6; E: 1/2; F: ∅

• 4.4:
  – a: .21
  – b: .91

• 4.6:
  – a: Experiment in two stages
  – b: There are 4 simple events: (Male, preschool), (Female, preschool), (Male, no preschool), (Female, no preschool),
  – c: In the order listed above: 8/25, 9/25, 6/25, 2/25
  – d: Male: 14/25; 2/25

• 4.9:
  – a: .58
  – b: .14
  – c: .46

• 4.11:
  – a: Three stage experiment; in each stage an answer, either “M” or “F”, is recorded
  – b: S consists of eight simple events: MMM, MMF, MFM, FMM, MFF, FMF, FFM, FFF
  – c: 1/8 each
- **d**: There are three simple events in which there is only one man: MFF, FMF, FFM; so probability is $\frac{3}{8}$
- **d**: There is only one simple event in which all three are women: FFF; so probability is $\frac{1}{8}$

**4.13:**

- **a**: The three symbols A, B, C are being put in order
- **b**: $S$ consists of six simple events: ABC, ACB, BAC, BCA, CAB, CBA
- **c**: We should assign probability $\frac{1}{6}$ to each simple event. There are 2 in which A is on top, so the probability of that is $\frac{2}{6} = \frac{1}{3}$. Similarly, probability of A at bottom is $\frac{1}{3}$

**4.16: NEED**

- **a**: There are four simple events: “guided”, “no part”, “as is”, “no opinion”
- **b**: Not equally likely: probability of “guided” is .36, of “no part” is .13, of “as is” is .46, and of “no opinion” is .05,
- **c**: There are two simple events that fit this event: “guided” and “as is”, so probability is $\frac{.36 + .46}{2} = .82$
- **d**: .13 (only one good simple event)

**4.19:**

- **a**: $5 \cdot 4 \cdot 3 = 60$
- **b**: $10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 = 3,628,800$
- **c**: $6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 720$
- **d**: 20

**4.20:**

- **a**: $5!/3!2! = 10$
- **b**: $10!/9!1! = 10$
- **c**: $6!/6!0! = 1$
- **d**: $20!/1!19! = 20$

**4.26**: $4.12 \cdot 4 = 192$

**4.33**: $C_{10}^{90} \approx 5.7 \times 10^{12}$ (order doesn’t matter)

**4.34:**

- **a**: $C_{5}^{2} = 10$ (order doesn’t matter)
- **b**: Since committees have only two members, there is only one that has Smith *and* Jones; so probability is $1/10$. 