

Math 210 – Topics in Finite Math

Fall 2007 – First Midterm

Name: \_\_\_\_\_

TA: \_\_\_\_\_

VERSION A

- (a) The exam has 5 problems.
- (b) Show your work for every problem. Answers without justification will not receive credit.
- (c) Calculators are not allowed.
- (d) There is a blank page at the end of the exam for if you need it.

Problem	Points	Score
1	20	
2	20	
3	20	
4	20	
5	20	
Total	100	

1. (a) (10 points) We flip a fair coin 12 times, what is the chance that we flip heads exactly 8 times?

(b) (10 points) We flip the first time and we get heads. What is now the chance that we get exactly 8 heads?

2. (a) (10 points) How many 8-letter "words" can you make from the letters of the word *business*?

(b) (10 points) How many 2-letter "words" can you make from the letters of the word *business*?

3. (20 points) We throw 3 fair dice. What is the chance that we throw exactly one *six* and exactly one *five*?

4. (20 points) A sample space is partitioned into sets  $A_1$ ,  $A_2$  and  $A_3$ , with  $\Pr[A_1] = 0.5$  and  $\Pr[A_2] = 0.3$ . The event  $B$  satisfies  $\Pr[B] = 0.6$  and  $\Pr[B \cap (A_2 \cup A_3)] = 0.3$ . Are the events  $A_1$  and  $B$  independent?

5. An urn contains 6 balls, 2 green balls and 4 red balls. We draw one ball from the urn and keep it in our left hand, and then draw another ball with our right hand.

(a) (10 points) What is the chance that the two drawn balls have different colors?

(b) (10 points) If the ball in our right hand is red, what is the chance that the ball in our left hand is red as well?