

MA 111 - Contemporary Mathematics

Test 3

April 14, 2006

Name:_____

Score:_____ /100 Points

Instructions:

- You may not use any outside assistance on this exam. You may not use books, notebooks, other people's exams, or any other materials to cheat on this exam.
- You may use a graphing calculator on this exam.
- The use of electronic equipment such as mp3 players, ipods, cell phones and other electronic devices (besides your calculator) during the exam is prohibited.
- If you are caught cheating on the exam, you will be given a 0 for a grade.
- Write clearly during the exam and fully erase or mark out anything you do not want graded.
- **You must show all your work to receive full credit unless otherwise stated.**

1. Find the probability of being dealt two Kings and three cards of the same rank (not kings) from a standard 52-card deck? [15 points]

- License plates are printed by the State of Massachusetts using the format: two digits, followed by two letters, followed by two digits. Assuming all arrangements of letters are allowed, what is the probability the last digit is a 6? [15 points]

3. In a survey of 370 college students, I found 274 love math, 107 own an MP3 player, and 85 both love math and own an MP3 player.

(a) Draw a Venn diagram describing this situation. [15 points]

(b) What is the probability a student from this group loves math but does not have a MP3 player? [5 points]

(c) What is the probability a student from this group loves math if they do not have an MP3 player? [5 points]

4. Compute the following [5 points each]:

(a) If $P(R) = 0.68$ and $P(S \cap R) = 0.23$, find $P(S|R)$.

(b) If the odds of the Red Sox winning the World Series are 3:7, what is the probability they win the World Series?

(c) If a casino's house odds of Tony Blair remaining British Prime minister for the next 5 years are 8:3, what is the probability Tony Blair remains British Prime minister for the next 5 years?

5. (a) A jar contains 12 black balls and 7 red balls. Draw a tree diagram showing all the possible ways to pick two balls from the jar (without replacing the balls). Include the probabilities on each branch (remember you need 2 pictures). [15 points]

- (b) From the tree diagram, what is the probability you first draw a red ball and second draw a black ball? [5 points]

6. Manny runs a game which is fair and costs \$10 to play. If the probability of losing is 0.75, what should Manny pay to the winners of his game? [10 points]

7. Extra Credit:

(a) Who invented the Venn diagram and in what century did he invent it?
You must give the person's first and last name. [5 points]

(b) State the Law of Large Numbers. [5 points]