QUIZ 2 (SECTION 4-6, CHAPTER 5)

MATH 119 – SPRING 2013 – KUNIYUKI
105 POINTS TOTAL, BUT 100 POINTS = 100%
Show all work, simplify as appropriate, and use "good form and procedure" (as in class).
Box in your final answers!
No notes or books allowed. A scientific calculator is allowed.

You may detach the attached tables on the back and write on them, but turn them in with your test. Nothing you write on the tables will be graded.

1) (3 points). Which of the following is equal to $_nP_r$ for reasonable r and n?
   Box in one:

   a. $\dfrac{n!}{r!}$ b. $\dfrac{n!}{(n-r)!}$ c. $\dfrac{n!}{r!(n-r)!}$

2) (3 points). Which of the following is equal to $_nC_r$ for reasonable r and n?
   Box in one:

   a. $\dfrac{n!}{r!}$ b. $\dfrac{n!}{(n-r)!}$ c. $\dfrac{n!}{r!(n-r)!}$

FROM THIS POINT ON, DO <u>NOT</u> LEAVE *P*, *C*, OR FACTORIALS IN YOUR FINAL ANSWER. SIMPLIFY COMPLETELY! YOUR ANSWER TO EACH OF PROBLEMS 3) THROUGH 5) WILL BE AN INTEGER (A "SIMPLE NUMBER"). SHOW SOME WORK JUSTIFYING YOUR ANSWERS; DON'T JUST WRITE ANSWERS.

<u>Note</u>: None of these answers is "one" or "none." Some people get confused by what these kinds of problems are asking!

3) (5 points). You have five different cards in your hand. How many ways are there to order the cards from left to right in your hand? "Ties" are forbidden.

4) (5 points). Ten teenagers want to play basketball. How many ways are there to form two teams of five people each, assuming that we do <u>not</u> yet care about positions on the teams? We are assigning people to "Team A" and "Team 1."

5) (5 points). There are nine students in Mrs. Krabappel's class. How many ways can a president, a vice president, and a treasurer be chosen? Assume that no one can hold more than one position, and there are no "ties" for the positions.

IN THE FOLLOWING PROBLEMS, ROUND OFF YOUR <u>FINAL</u> ANSWERS TO THREE DECIMAL PLACES (OR GIVE AN EXACT ANSWER AS A DECIMAL), UNLESS OTHERWISE SPECIFIED. BEFORE YOU GIVE YOUR FINAL ANSWERS, GIVE EXACT NUMBERS IN YOUR CALCULATIONS <u>OR</u> ROUND THEM OFF TO AT LEAST FIVE SIGNIFICANT DIGITS.

6) (3 points). If the table below gives a probability distribution, what must the value of c be?

x	$P(x)$
0	0.102
1	0.243
2	0.500
3	c
4	0.004

7) (8 points). A game costs $10 to play. If you win the game, you receive a check for $100 (but you do <u>not</u> get your $10 back!). The probability that a player wins the game is 0.08. You will play the game. What is the expected value of the change in your wealth?

8) (20 points total). A probability distribution is given below. In parts a) and b), round off answers to three decimal places.

x	$P(x)$
0	0.323
1	0.301
2	0.194
3	0.143
4	0.039

a) Find the mean of this distribution. (6 points)

b) Find the standard deviation of this distribution. (14 points)

9) (24 points). X is a random variable that has as its probability distribution the binomial distribution $\text{Bin}(n = 4,\ p = 0.43)$. X counts the number of successes among the four trials. Describe this distribution by filling out the table below. Show all work! When rounding off calculations, do so to at least five significant digits, except round off your answers in the table to three decimal places.

x	$P(x)$
0	
1	
2	
3	
4	

10) (8 points). Assume that 76% of adult Americans believe that Lindsay Lohan should get a job. Seven adult Americans are randomly selected. What is the probability that exactly five of them believe that Lindsay Lohan should get a job? Round off calculations to at least five decimal places, but round off your answer to three decimal places.

11) (5 points). A test consists of nine multiple-choice questions, each with five options (A, B, C, D, and E). Each question has exactly one correct option. Assume that a student guesses randomly on all the questions; that is, each option is equally likely to be chosen by the student on any question. What is the probability that the student will get fewer than four correct answers on the test? Use Table A-1.

12) (16 points total). McWendy's has millions of regular customers. Based on a trusted survey (which we will assume to be accurate), 68% of them are satisfied with the service. Let X represent the number of service-satisfied customers in a randomly selected group of 60 regular McWendy's customers. In parts a) and b), treat X as a random variable.

   a) Find the mean of X. Don't round off.

   b) Find the standard deviation of X. Round off your answer to three decimal places.

   c) The McWendy's location owned by Jay and Silent Bob has 60 regular customers, and 31 of them are satisfied with the service. What is the corresponding z score? Round off your answer to two decimal places.