

Math 132 (Mulaire)

Final Exam

Name: _____

problem scores:	1: _____	2: _____	3: _____	4: _____
	5: _____	6: _____	7: _____	8: _____
total score:	_____			

Instructions: Do all problems on the exam. You will be graded both on the correctness of your answers and the correctness of your methods or reasoning. Calculators, notes, etc., are not allowed on this exam. You do NOT need to simplify your answers.

1) You roll two fair, five-sided dice.

a) [3 points] What is the probability that the sum of the two dice will be three or less?

b) [4 points] Given that the sum of the dice is five or less, what is the probability that the sum of the two dice will be three or less?

2) On the TV game show "The Price Is Right!", five contestants are selected from the studio audience by putting all the audience members' names into a box and randomly drawing five names out of the box, one at a time. There are 200 people in the audience, and you are one of them!

a) [3 points] What are your chances of being the first person selected to be a contestant?

b) [3 points] What are your chances of being the second person selected to be a contestant?

c) [4 points] What is the probability that you won't get picked as one of the five contestants?

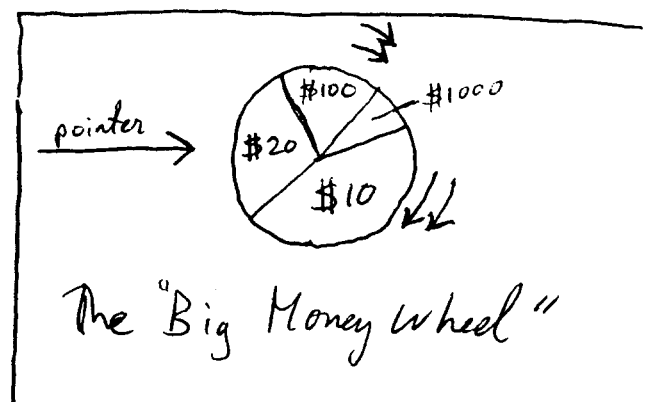
d) [4 points] Suppose you came with a group of nine of your friends. (I.e., there are a total of 10 people in your group, counting you.) What is the probability that at least one person from your group will get to be a contestant?

3) Lucky you! Not only were you selected to be a contestant on the Price Is Right, but you have been given the opportunity to spin the "Big Money Wheel." The Big Money Wheel (see picture below) has four sectors, labelled \$10, \$20, \$100, and \$1000. You will spin the wheel and win the amount of money shown on the sector that ends up next to the pointer.

By looking at the size of the sectors, you decide that the probability of winning \$100 is twice as large as the probability of winning \$1000, the probability of winning \$20 is three times as large as the probability of winning \$1000, and the probability of winning \$10 is four times as large as the probability of winning \$1000.

a) [4 points] Based on the above, what is the probability that you will win \$1000?

b) [4 points] If you were to spin the Big Money Wheel many times, how much would you expect to win, on average, per spin?



4) [3 points] I own six different pairs of pants, 10 different shirts, 2 different pairs of shoes, and three different belts. How many different pants/shirt/shoes/belt combinations are there for me to choose from?

5) [3 points] How many three digit numbers are there whose digits are all different? (Examples of three digit numbers whose digits are all different: 325, 829, 102. Examples of three digit numbers whose digits are not all different: 111, 292, 664.)

6) [3 points] Congresswoman Baldwin has just been elected to the House of Representatives. The House has seven committees, and Baldwin will be assigned to exactly three of them. How many different combinations of committee assignments are possible?

7) When a family has a new child (i.e., through birth or adoption), there is a 50% chance the child will be a girl and a 50% chance it will be a boy. The Jones family has two children.

a) [3 points] What is the probability that both of the Jones' children are boys?

b) [4 points] If you know that one of the Jones' children is a boy, what is the probability that their other child is a girl?

8) [5 points] Ms. Smith, the parent of one of your students, has come in to meet with you about her son Bobby's performance on a recent standardized test. Ms. Smith got a copy of Bobby's score report. Ms. Smith says to you, "The report said that his score was in the bottom third of the class, but it also said that his score on the test was 5 points higher than the mean score for his class. How could both of those be true?! The report must be wrong."

Must the report be wrong? If so, explain why the report's two statements about Bobby can't be true. If the report could be correct, explain how it could be that the two statements are both true. (If you need more space for your response, use the back of this page.)