

**Statistics 1001**  
**Fall 1997**  
**Geyer**  
**Second Midterm**  
**November 21, 1997**

The exam is closed book and closed notes. You may use a calculator and the two normal curve tables handed out in class. Put all of your work on this test form (use the back if necessary). Show your work or give an explanation of your answer. No credit for numbers with no indication of where they came from.

The points for the questions total to 100. There are 2 pages and 6 problems.

1. [10 pts.] Two cards are dealt from a well shuffled deck. What is the probability that both are aces? (The deck has 52 cards and 4 aces).
  
2. [20 pts.] The probability of winning a bet on red at roulette is  $18/38$ . A gambler makes four such bets.
  - (a) What is the probability that she wins all four?
  
  - (b) What is the probability that she wins at least one of the four?
  
3. [20 pts.] 25 draws with replacement are made from the box

1	2	3	4	5
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- (a) What is the expected value for the sum of draws?
  
- (b) What is the standard error for the sum of draws?

4. [20 pts.] 100 draws with replacement are made from a box. The average of the numbers on the tickets in the box is 4, and the standard deviation of the numbers in the box is 2. What is the chance that the sum of draws is greater than 450?

5. [20 pts.] A recent CNN/USA Today/Gallup poll surveyed 1,006 adult Americans. One of the questions was whether they wanted campaign-reform legislation passed this year. 55 percent said yes, 35 percent said no, and 10 percent were undecided.

Assume that the 1,006 respondents were a simple random sample of adult Americans and calculate a 95% confidence interval for the true percentage of adult Americans that want campaign-reform legislation passed this year.

6. [10 pts.] Lots of TV stations conduct “instant polls” in which the viewers are asked to call a 900 number and register their votes for or against an issue (each call costs the caller 50 cents). At the end of the show, the station announces the results. Do such polls give useful information about the opinions of the general population or even about the opinions of the viewers of that particular news program?