Statistics 2
Second Midterm Exam
Spring 2000

Printed Name _____
(Please also print your name at the top of each page)

Signature _____

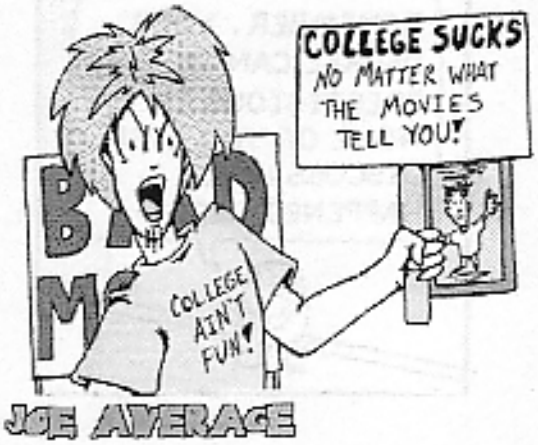
Student ID #_____

Circle your TA: Susan Alber Nicola Armstrong Tony Hua Pawel Lasieki Michael Roberts

There are 7 problems on the exam

1	2	3	4	5	6	7	total

Show your work. A correct answer with no justification or incorrect reasoning will receive no credit. Arithmetically complicated formulas, such as factorials, can be left in unreduced form.



1. [2] A deck of 52 cards is shuffled and three cards are dealt off the top. What is the chance that none of them are face cards (Jacks, Queens, or Kings)?

2. [2] A six sided die is rolled 10 times. Find the chance of exactly three or four "ones" appearing during these 10 rolls.

3. [2] On each of 32 days Marilyn tosses a fair coin 5 times. What is the chance that she never tosses 5 heads or 5 tails during this time?

4. [2] A survey research company estimates the percentage of the population of Austin, Texas that listens to a Spanish language radio program by taking a simple random sample of size 500. The population of Austin is about 500,000. The company now plans to extend their research to Dallas, which has similar demographics to Austin, but about twice the population. *True* or *False* and explain: To achieve about the same accuracy in Dallas as in Austin, the sample size should be doubled, to 1000.

5. A cable company takes a simple random sample of 400 households from a city of 37,000 households. Of these 400, 120 express strong interest in establishing internet access via cable.

(a) [2] Fill in the blanks or explain why you cannot do so: A 95% confidence interval for the percentage of households in the city that would express strong interest in internet access via cable is _____ to _____.

(b) [2] *True* or *False* and explain: The chance that the percentage of such households in the city is less than 30% is about 50%.

6. [4] A box contains tickets with the values 1,2,3,4,5. If an even number is selected, Jules pays Jim $1 and if an odd number is selected Jim pays Jules $1. This game is played 25 times. Find approximately the chance that Jim comes out ahead.

7. [4] There are 200,000 households in a certain city of which a simple random sample of 400 are selected. The median household income is $40,000 and the upper quartile is $60,000. The percentage of households in the sample with incomes over $60,000 will be around _____ give or take _____ or so.

Solutions to Practice Second Midterm

1. $\frac{40\times39\times38}{52\times51\times50}$

2. $\frac{10!}{3!7!}\left(\frac{1}{6}\right)^3\left(\frac{5}{6}\right)^7+\frac{10!}{4!6!}\left(\frac{1}{6}\right)^4\left(\frac{5}{6}\right)^6$

3. $\left(\frac{15}{16}\right)^{32}$

4. False

5. (a) 25.4 % to 34.6%

   (b) False

6. 16%

7. 25% give or take 2.1%