

Stat 3011 First Midterm Exam (In-Class Part) October 17, 2001

Name _____ Student ID _____

The exam is closed book. You may use a calculator, and one $8\frac{1}{2}$ by 11 sheet of paper with formulas (or anything else) on it, but no other notes. 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 50.

- [10 pts.] Name and describe two different kinds of bias (non-sampling errors) that can occur in polls and surveys. You need give only enough description so that it is clear you know what the terms mean.
- [10 pts.] The table defines the probability distribution of a discrete random variable X .

x	0	1	2	3	4
$\text{pr}(X = x)$	1/9	2/9	3/9	2/9	1/9

- Calculate the mean of the random variable X .
 - Calculate the standard deviation of the random variable X .
- [15 pts.] Assume that spins of a roulette wheel are statistically independent events. A gambler makes 10 consecutive bets on red. The probability of the gambler winning any one of his bets is $18/38 = 0.4736842$. What is the probability the gambler wins at least one of his 10 of his bets?
 - [15 pts.] Suppose X and Y are independent random variables, both having mean 3 and standard deviation 1. What are
 - $E(X + Y)$?
 - $E(X - Y)$?
 - $\text{sd}(X + Y)$?
 - $\text{sd}(X - Y)$?
 - $E(4X + 5)$?
 - $\text{sd}(4X + 5)$?