Instructions: You cannot use any books or notes. You can use a calculator, but not a computer. You are not allowed to communicate with anyone (verbally, in writing, or electronically), except for me, during the exam period (and at most I will clarify a problem — I won't give you any help with solving the problems). Phones should be kept out of your hands while you're taking the exam.

There are 4 problems having a total of 6 parts. Each part is worth 20 points, and your best 5 of 6 scores will be summed to obtain your score for this exam. To receive full credit, you need to **justify your answers**, using notation and terminology properly, and clearly defining any events that you use (that aren't defined in the statement of the problem).

Express probabilities as exact values (as fractions, or in decimal form), or else round them to three significant digits. (Note: 0.00402 has three significant digits, and 0.004 only has one significant digit.) Do not express final answers as expressions that need to be evaluated. (Your final answers should not include any letters, binomial coefficients, or even factorials.)

Put all of your work on these sheets. If you need more room, direct me to look for additional work on the back of a page. **Draw boxes around your final answers!**