401 Midterm 1

If you feel you do not have enough time, don't blame yourself. Maybe I put too much problems. Try to find easy problems and make sure you get points for them. **Don't panic**, good luck. Below is something you may use,

$$\binom{n}{k} p^k (1-p)^{n-k}.$$

If asked for a number, give it in the most simple fraction or decimal. I will check to 3 decimal places for correctness.

1. (16 pts) List **all** subsets of the set $S = \{0, 1, 2, 3\}$. I do **not** mean a proper subset when I say subset.

2. (16 pts) What is the sample space of money in your wallet in cents, if you know you only have quarters (25 cents) and dimes (10 cents) and that you have 10 or less coins? Use notation of the form,

$$S = \{x : \text{expression of } x \text{ and } y \text{ and } z, \text{ expression of } y \text{ and } z\},$$

where y and z are integers between 0 and 10. When I say expression, it involves an equality or an inequality.

3. (17 pts) In how many ways can 4 people sit in a round table? If one seating can be obtained from another seating by a rotation, it is considered to be the same seating.

4. (17 pts) I roll one dice. You roll two die. If my face value is smaller than the larger of the two die you rolled and larger than the the smaller of the two die you rolled, you win. What is the probability of you winning?

5. (17 pts) You move to the left with probability 0.2 and move to the right with probability 0.8. What is the probability you end up where you started or one step left or right of where you started if you take 10 steps with probability 0.5 and 9 steps with probability 0.5?

6. (17 pts) I rolled three dies. Given that the sum of the three face values is 7, what is the probability that the median is 2? Median is the number in the middle when you order the numbers from largest to smallest or smallest to largest.

SHOW ALL WORK BUT I'D RATHER YOU NOT WRITE ANYTHING THAN YOU WRITE IRRELEVANT THINGS.