

Math 191

Practice first hourly

Please don't simplify your answers: for example, the answer to the question "What are the odds that 10 coin tosses will result in 7 heads?" should be left in the form $\binom{10}{7}/2^{10}$, rather than multiplied out. Each question is worth 25 points.

1. A die is rolled until an even number comes up. What is the probability that, up to and including that roll, at least one number divisible by 3 has come up?
2. Six balls are placed at random in 3 bins. What are the odds that no two of the three bins will receive the same number of balls?
3. Among all paths from the point $(0, 0)$ to the point $(2n, 0)$ (in the sense of Chapter III), how many have maximum height exactly k ?
4. A lottery has odds of 10,000,000 : 1 against winning. Using the Poisson approximation, assuming 25,000,000 people each buy one lottery ticket, what are odds that exactly two people win? That exactly three people win? Which is more likely?
5. What are the odds that a bridge hand will contain no aces, given that it has exactly two spades?