

Math 421 - Generating Functions Homework

1. Use a probability generating function to find the probability of rolling a total of 7 when you roll 3 six-sided dice.
2. Find the probability of rolling a total of 7 or less using 3 six-sided dice.
3. Make a probability bar graph for rolling 3 six-sided dice and adding the results. Show each possible outcome on the x -axis and corresponding the probability on the y -axis. What do you notice about the shape of the graph?
4. I have two kids. My brother also has 2 kids, and my sister has 3 children. Suppose that all of our kids put their names in a hat, then each kid draws one name out. How many different ways can the kids draw names so that everyone has the name of a cousin at the end (no one gets their own name or the name of a sibling)?
5. In the previous problem, what is the probability that the hat draw works out so that no one gets their own name and no one gets the name of a sibling?
6. How many ways can you make change for \$120 using ones, fives, tens, and twenty dollar bills?
7. Repeat the last problem, but suppose the cash register only has 7 twenties, 8 tens, 13 fives, and 39 ones.