

Charlotte Math Meetup

Week 21 (Level M)

It's mid-autumn day, a festival in China when family members get together and eat mooncakes. Dr. Hong takes out 3 mooncakes of the same flavor and cuts each mooncake into 4 equal pieces. He then asks Leo to allocate them to the Hong family: Dr. Hong, Dr. Wang, Leo, Angela, and Elon.

1. How many different ways can Leo allocate the mooncake pieces?
2. If Leo has to give at least one piece to each family member, how many different ways can Leo allocate the mooncake pieces?
3. If Leo has to give at least one piece to each family member, what's the likelihood that Leo gets more pieces than the number of pieces any other family member gets?
4. If Leo has to give at least one piece to each family member, and more pieces to each parent (Dr. Hong and Dr. Wang) than any kid (Leo, Angela, and Elon), how many different ways can Leo allocate the mooncake pieces?
5. (Optional) If Dr. Hong takes out 4 mooncakes instead of 3, under the same settings, what are the answers to the previous 4 questions?