Discrete Probability and Review Worksheet 6

1. Suppose there are 12 people in a room. Show that you can choose two groups of people in the room such that the sum of ages (in years) of both groups is the same. Note: the groups should not overlap but they may contain just one person each.

2. How many anagrams does "ouroboros" have?

3. Suppose you roll a fair 4-sided die 7 times in a row. What is the probability that all 4 numbers are rolled at least once?

4. Suppose you and your three friends find 100 identical marbles on the ground.
   (a) How many ways are there to divide the marbles between you and your friends?
   (b) How many ways are there to divide the marbles if everybody has to get at least three marbles?
   (c) How many ways are there to divide the marbles if nobody can get more than 30 marbles?