With each solution you should write a sentence or two explaining your reasoning.

1. Montaigne eats breakfast, lunch, and dinner every day of the week. He eats 12 of these meals at home; the other 9 he has at La Coupole.
   (a) How many possible dining schedules involve at most one Saturday meal at La Coupole?
   (b) How many possible dining schedules involve at least one meal at home every day?

2. Six Capulets and three Montagues are having a debate.
   (a) In how many ways can they be put in a line if we view all people within a family as indistinguishable?
   (b) In how many ways can they be put in a line if we can tell the Montagues apart, but the Capulets are all interchangeable?
   (c) They decide to settle their dispute with swords, with each Montague fighting two capulets. How many ways can this battles be organized?

3. Your studio has 30 people divided into ten squads of 3. A team consists of 5 people selected from these 30.
   (a) How many possible teams are there where everyone comes from a different squad?
   (b) How many possible teams are there with exactly two people from the same squad?
   (c) How many possible teams are there with two pairs of people who come from the same squad?
   (d) How many possible teams are there with members drawn from exactly three squads?

4. A committee is to be selected from \( n \) people, and one of the committee members is to be selected as chair of the committee.
   (a) How many possible selections are there for a committee of size \( k \) and its chair?
   (b) How many possible selections are there for the committee and chair if we consider every committee size from 1 to \( n \)?