

**Problem 1.** Let  $N$  and  $C$  be finite sets with  $|N| = n$  and  $|C| = c$ . In this problem, a *card* (in the game of  $N$ -type,  $C$ -characteristic *Set*) will be a function  $f : C \rightarrow N$ .

- (i) Explain the relationship between these cards and the cards in the game of *Set*.
- (ii) Write down a precise definition of a set in the game of *Set*. (Make sure to underline the word “set” when talking about sets from the game so that they do not get confused with mathematical sets.)

**Problem 2.** How many cards are there in a deck of  $N$ -type,  $C$ -characteristic *Set*?

**Problem 3.** Calculate the number of sets in a deck of 4-type, 5-characteristic *Set*. A set may have any number between 0 and 4 characteristics in common. For each number between 0 and 4, determine how many sets there are with that many characteristics in common.