1. Injection, Surjection, or Bijection?
   For each of the following functions from $\mathbb{R}$ to $\mathbb{R}$, determine whether it is an injection, surjection, bijection, or none of the above.
   
   1. $f(x) = 2^x$
   2. $f(x) = x^2$
   3. $f(x) = 2x + 1$

2. Union of Countable Sets
   Prove that if $A$ is countable and $B$ is countable, then $A \cup B$ is countable.

3. A city of $n$ people must elect its city council. The council has a president, a vice president, a secretary, and $k$ general members (the $k$ general member positions are identical). How many ways are there to choose the city council from among the $n$ residents?
4. A license plate contains 5 characters (order matters). Each character may either be an upper-case letter A-Z or a number 0-9. How many license plates...

1. contain only letters?

2. have exactly three letters and two numbers?

3. contain the string ABC?

4. have at least two of the same character?