
CS 70 Discrete Mathematics and Probability Theory

Summer 2016 Dinh, Psomas, and Ye Discussion 3A

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?