**A man finds himself on a riverbank with a cat, a parrot and a bag of seed. He needs to transport all three to the other side of the river in his boat. However, the boat has room for only the man himself and one other item (either the cat, parrot or seed). In his absence, the cat could eat the parrot, and the parrot would eat the bag of seed. Show how he can get all the passengers to the other side without leaving the wrong ones alone together.**

Our goal is to get everything to the other side of the river without leaving certain items together. The constraints are: the bird and can’t can not be left alone, nor can the parrot and the bag of seed. In a situation like this I can only think of a single solution.

1. The man brings the parrot over

2. He goes back to get the bag of seed

3. He drops the bag of seed off and takes the parrot

4. He drops the parrot of on the original side and takes the cat

5. He drops the cat off to be with the seed

6. He goes back to get the parrot

7. He brings the parrot over and now they are all on the other side

**There are 20 socks in a drawer: 5 pairs of black socks, 3 pairs of brown and 2 pairs of white. You select the socks in the dark and can check them only after a selection has been make. What is the smallest number of socks you need to select to guarantee getting the following:**

**a) At least one matching pair**

**b) At least one matching pair of each color**

**A little girl counts using the fingers of her left hand as follows: She starts by calling her thumb 1, the first finger 2, middle finger 3, ring finger 4, and little finger 5. Then she reverses direction, calling the ring finger 6, middle finger 7, first finger 8 and thumb 9, after which she calls her first finger 10 and so on. If she continues to count in this manner, on which finger will she stop?**

**a) What if the girl counts from 1 – 10**

**b) What if the girl counts from 1 – 100**

**c) What if the girl counts from 1 – 1000**