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Problem Solving

A Cat, a Parrot, and a Bag of Seed:

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.

For this question I will break it down into cat=A, parrot=B, and seed=c. the question is how to move ABC one by one without leaving A/B or B/C alone. With seeing that B is the letter that cannot be left alone with A or C we can come to the conclusion that B will be the first to move. After moving B we then will return to object A and C. The next problem will be that if I take A or C and return to pick up the last A or C will be left with B. If after moving A or C I also move object B back to the original position I can then move A or B depending on which I choose I can then move all objects without having B interact with A or C. After moving B I will now move object C. After moving C I will move object B back to the original position. I wil now move object A to the new position. Leaving A anC together I will return to the original position and now move object B for the last time solving the problem.

Socks in the Dark:

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 made. 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.*

Predicting Fingers:

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 finder 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 to 10

b) What if the girl counts from 1 to 100

c) What if the girl counts from 1 to 1000