Problem #1

1. A. a man needs to get across a river on a boat. He has 3 things with him but the boat only fits himself and one other thing. What should he leave behind? What order should he take items?

B. I have never heard of a cat eating seeds

C. The goal is to get the man and all his things across the river, intact.

2. A. The sub goals are to figure out which combination works best.

a. Cat and seed?

b. Cat and bird?

c. Bird and seed?

B. The constraints are that some combination of items will result in one pet eating the other or the seed.

3. A. Cat and seed- seems like correct choice

Cat and bird- leave cat or bird in cage so cat doesn’t eat bird

Bird and seed- put bird in cage so bird doesn’t eat seed.

4. A. Each solution does seem to meet the goals.

B. Each solution is different for every case.

5. A. I choose the solution of putting one animal in a cage while the man goes across with the seed first.

B. This would work because the animals wouldn’t eat each other or the seed while the man is crossing the river to retrieve the other items.

Problem #2

1. A. If a person were to pick random socks from a pile of 20 socks of 3 different colors (10 black, 6 brown, 2 white) what the smallest number you need to pick out in order to get a pair and what’s the smallest number you need to pick out to get a pair of each color.

C. The over all goal is to determine how many socks you need to pick to get a pair and how many you need to get a pair of each color.

2. A. The sub goals are to count each pair

Try to use actual socks as a demonstration.

B. The constraints are that you can’t guarantee something that is random.

3. A. possible solutions

1. To guarantee 1 pair you need to pick out at least 4 socks.

2. To pick out 1 pair you need to pick out 2 socks minimum.

3. To pick 3 pairs you need to pick out 6 socks minimum.

4. To guarantee 1 pair you need to pick out all 20 socks.

5. To guarantee 3 pairs you need to pick out all 20 socks.

4. A. Each solution somewhat meets the goals the only that works for both questions is that you need to pick 20 socks to guarantee 1 or 3 pairs.

5. A. The only guaranteed solution is to pick out 20 socks to get the pairs you need to answer the questions.

B. I actually worked for a long time with my actual socks before the answer clicked that the only way to guarantee something decided at random is to pick them all.

Problem #3

1. A. If a girl uses the fingers of one hand to count.(thumb=1, pointer=2, middle=3, ring=4, pinkie=5,ring=6, middle=7, pointer=8,thumb=9) and so on. If she continues this way which finger will she be on when she counts 10, 100, and 1000.