1. Item transport
   1. Problem
      1. Man must transport three items across a river
         1. 1 cat, 1 parrot, 1 bag of seed
      2. Only one boat available to transport items across river
   2. Sub-problems
      1. Boat only able to transport man and one other item at a time
      2. Cat cannot be left alone with parrot, or it will eat parrot
      3. Parrot cannot be left alone with seed, or it will eat seed
   3. Possible Steps Towards Solution
      1. Man transports parrot across river first, leaving cat and seed
         1. Man returns across river
            1. Leaves parrot
            2. Transports nothing
      2. Man transports cat across river, leaving seed
         1. Man returns across river
            1. Leaves cat
            2. Transports parrot back across
      3. Man transports seed across river, leaves parrot
         1. Man returns across river
            1. Leaves seed with cat
            2. Transports nothing
      4. Man transports parrot across river
   4. All items now across river
      1. Sub-problems avoided
         1. All items transported one at a time
         2. Cat never left alone with parrot
         3. Parrot never left alone with seed
2. Socks in the Dark
   1. Problem
      1. Select matching socks out of sock drawer
      2. Select from 20 total socks
         1. 10 black socks
         2. 6 brown socks
         3. 4 white socks
   2. Sub-problems
      1. Selection done in complete darkness
      2. Socks cannot be seen until after selection is made
      3. Have one matching pair
      4. Match one pair match for each color
   3. Steps to conclude
      1. Draw one of each
         1. Smallest number would be one draw of each color
         2. 3 total colors would be total draw of 3
         3. 4th draw would be match for black socks
      2. To match all colors
         1. Continue draw of socks
         2. Following same principle of smallest number, one draw would be of each color
         3. Smallest number for matching all colors would be 12
            1. Since white has total of 4 socks, 4 rounds of drawing one of each color would be required to have matching socks for all colors
3. Predicting Fingers
   1. Problem
      1. When counting using one’s fingers, predict which finger the following numbers fall on
         1. 10
         2. 100
         3. 1000
   2. Sub-problems
      1. Fingers counted only on one hand
      2. Counting starts on thumb as #1
      3. Numbering system cycles around each finger, never counting same finger twice in a row
         1. On first round, pinky counted as #5, then returns in opposite direction with ring finger as #6
   3. Possible solutions
      1. Multiples of 10 wouldn’t work
         1. As fingers aren’t duplicated in numbering system, beginning or ending fingers aren’t the same
      2. Multiples of 9 wouldn’t work
         1. See above reasoning
      3. Physically count each finger
         1. Notice that multiples of 10 rotate between index and ring fingers
            1. 10 – index
            2. 20 – ring
            3. 30 – ring
            4. 40 – index
            5. 50 – index
   4. Final solution
      1. 10th finger – index
      2. 100th finger – ring
      3. 1000th finger - index