Some Logical puzzles I found online, they were a lot of fun to try!

Scavenger Hunt

Devin is arranging a scavenger hunt for five of his friends, but some of them are much better at solving clues than others, so he wants to give some of them a head start.

1. Before John can start, Taylor must get a head start
2. Before Nkosi can start, Emil must get a head start
3. Before Tanya can start, Nkosi and John must both have a head start
4. Before Taylor can start, Nkosi and Emil must both have a head start

In what order should Devin's friends start the scavenger hunt?
Explain how you went about figuring out the order.

Solution:

1. JOHN > TAYLOR
2. NKOSI > EMIL
3. TANYA > NKOSI AND JOHN
4. TAYLOR > NKOSI AND EMIL

From 1 and 4:

JOHN > TAYLOR > NKOSI AND EMIL

Coupled with 2:

JOHN > TAYLOR > NKOSI > EMIL

We know from 3 that:

TANYA > JOHN

Therefore:

TANYA > JOHN > TAYLOR > NKOSI > EMIL

Order is:

Emil, Nkosi, Taylor, John and Tanya

Crack the code

A safe-breaker is attempting to crack a safe with a 7-combination code. So far they have worked out that:

- The first digit is double the third digit
- The code is a palindrome (it reads the same if it is reversed)
- The fourth number is 7
- The third number is one less than the sixth number
- The second number is 3 less than the fourth number

Can you advise the safe-breaker on the correct combination?

Solution:

Start (?)(?)(?)(?)(?)(?)(?)

"The first digit is double the third digit"

(2x)(?)(x)(?)(?)(?)(?)

"The code is a palindrome (it reads the same if it is reversed)"

(2x)(?)(x)(?)(x)(?)(2x)

"The fourth number is 7"

(2x)(?)(x)(7)(x)(?)(2x)

"The third number is one less than the sixth number"

(2x)(4)(x)(7)(x)(x+1)(2x)

I know that the 6th and 2nd number are the same meaning x+1 = 4 making x = 3 meaning 2x = 6.

so we get

(6)(4)(3)(7)(3)(4)(6)

Marble Thief:

A group of friends are playing a game of marbles on a playground, and they have a LOT of marbles. Every time they play a game of marbles, they lose 5 marbles as it's a big playground and they can't be bothered to look for marbles that roll away somewhere. Every time a game of marbles ends (each game takes 10-15 minutes), they collect all their marbles in a big box, hide it behind a tree, and go for a quick run.

Every time these kids hide all their marbles in a box behind the tree, a very intelligent squirrel sneaks up to the box, and if there are more than 12 marbles in it, the squirrel steals 3 marbles and runs off.

If this group of kids started with 120 marbles in total, how many games can they play in total before they have less than 10 marbles left (given that they lose some marbles each time they play, and a squirrel steals some marbles each time they go for a run).

Provide a number as the answer. Also, describe how you calculated the answer (so that you can get some credit for your thought process, even if the answer itself may be incorrect! Our aim here is to assess how you think.)

Solution:

120 -10(8) = 10 games played - 40 marbles left

120 - 13(8) = 13 games played - 16 marbles left

So on the 14th game, they will lose 5 marbles as normal, making 11 marbles

Since 11 is less than 12, the squirrel no longer takes any more marbles, they only lose 5 marbles from the games.

14th game = 11 marbles left

15th game = 6 marbles

So it will take the kids 15 games to have less than 10 marbles left.

Husbands names:

Upon returning from a year long working holiday, Alberta, the youngest of 4 sisters, announced her whirlwind marriage. Her 3 sisters, Carla, Paula, and Roberta, were amazed by her husband's name.

- The 4 men are Albert, Carl, Paul, and Robert. Their last names are Albertson, Carlson, Paulson, and Robertson.
- No woman's husband has a first name that consists of her first name without the final "a"; no woman's last name consists of her first name without the final "a" and with "son" on the end; and, no man's last name consists of his first name with "son" added at the end.
- Paul is not married to Roberta, and Robert is not married to Paula.
- No husband and wife have "bert" in both their first names, but there is a man who has "bert" in his first and last names.
- Carl's last name is not Paulson.

Work out Alberta's husband's first and last name, as well as Carla's, Paula's, and Roberta's husbands' first and last names.

Solution:

First let us find the couples:

Alberta's last name Cannot be Albertson

There are no Albert Albertson's etc.

Paul is not married to Roberta and Robert is not married to Paula

So Paul is either married to Alberta or Carla (Not Paula from 1st condition)

Robert is either married to Alberta or Carla (Not Roberta from 1st condition)

but "No husband and wife have "bert" in both their first names" - So Robert must be married to Carla.

Couple 1: Robert and Carla

If Robert is with Carla, then Paul must be with Alberta.

Couple 2:

Paul and Alberta

This leaves us with Albert and Carl (Husband) and Paula and Roberta (Wives)

We know that "No husband and wife have "bert" in both their first names" - meaning Albert and Roberta cannot be married.

Leaving Albert and Paula.

This means Carl and Roberta are together.

Couple 3: Albert and Paula

Couple 4: Carl and Roberta

Now we have the couple's, let us find their last names.

Carl and Roberta:

Carls last name is not Paulson from the information given. It's also not Carlson or Robertson. Leaving Albertson.

So we have Carl and Roberta Albertson.

Robert and Carla:

Last names CANNOT be Robertson or Carlson

So it's either Albertson or Paulson, but Albertson is taken from Carl and Roberta

So their last name is Paulson.

So we have Robert and Carla Paulson.

Albert and Paula:

There are Robertson and Carlson as last names left.

Since "there is a man who has “bert” in his first and last names", this means that Albert's last name MUST be Robertson.

As Robert's last name is Paulson.

So we have Albert and Paula Robertson.

Finally, by process of elimnation, this means that Paul and Alberta's last name is Carlson.

To conculde, the married couples and their last names are:

Carl and Roberta Albertson

Robert and Carla Paulson

Albert and Paula Robertson

Paul and Alberta Carlson