Do not See the solution "firstly Try by yourself"

Puzzles Set-1

1. Ant and Triangle Problem

Three ants are sitting at the three corners of an equilateral triangle. Each ant starts randomly picks a direction and starts to move along the edge of the triangle. What is the probability that none of the ants collide?

Puzzle Solution:
So let's think this through. The ants can only avoid a collision if they all decide to move in the same direction (either clockwise or anti-clockwise). If the ants do not pick the same direction, there will definitely be a collision. Each ant has the option to either move clockwise or anti-clockwise. There is a one in two chance that an ant decides to pick a particular direction. Using simple probability calculations, we can determine the probability of no collision.
P(No collision) = P(All ants go in a clockwise direction) + P(All ants go in an anti-clockwise direction) = 0.5 * 0.5 * 0.5 + 0.5 * 0.5 * 0.5 = 0.25.

2. Find the faulty coin

You have ten stacks of ten coins each and each of them weighs 10 gm. However, one of the stacks is faulty and each of the coins in it weighs only 9 gms. What is the least number of times you have to weigh to find the faulty coin?

Solution
Yup 10 would be ideal but not the least. The least number of times you have to weigh is just once! Line up the stacks and pick 1 coin from first stack, 2 coins from second stack, 3 coins from third stack and so on. You will have a total of 55 coins. Now weigh it. If all of them were the right weight, the total would be 550 gms. If the total is 549, the first stack is faulty; if the total is 548 then the second stack is faulty and so on.

3. Find the age of sons

Arun has three sons and his friend Shakti wants to know their ages. Arun gives him three hints as Shakti couldn't answer till the third hint –

- The product of their ages is 72
- The sum of their ages is the same as my house number
- The oldest of sons love chocolate ice cream

Solution
First, you will get 12 possibilities for the equation XxYxZ = 72. Next, the sum of each of the numbers is added. You get a variety of numbers but there are two possibilities where the sum is 14. 2+6+6 and 3+3+8. Arun mentioned that his oldest like chocolate icecream, which meant there is only one older child and hence, the sons ages are 3,3 and 8.

4. Calculating pay using 7 units gold rod

A contract employee needs to be paid everyday but the employer has only one rod of 7 units of gold. He can make only at max 2 cuts. How does he manage to pay him?

Solution
The employer makes two cuts so that he has units of 1, 2 and 4.
Day 1, the employer gives him 1 unit. On day 2, the employer takes back the 1 unit and gives him 2. On day 3, he gives him 1 unit. On day 4, he takes back the 1 and 2 units and gives him a 4 unit. So on until day 7 when he gives him all the units.

5. Switching on the right bulb

You have a room behind a door and there are three bulbs inside the room. You can find its three switches outside the door. You can switch them on and off as many times as you wish but once you open the door you cannot change them. Identify which switch is connected to which bulb.

Solution
Let the lightbulbs be X, Y and Z. Switch on and off X for 5 to 10 times. Now immediately switch off X and switch on Y and open the door. The lightbulb which is on is Y. The lightbulb which is hot but off is X. The lightbulb which is off and cold is Z.

6. Find the colour of the last ball

You have bag with 20 blue and 13 red balls. Your task is to pick two balls in succession. If the balls are the same colour then you remove them and replace them with a blue ball. If the balls are of different colour then you remove them and replace them with a red ball. What is the colour of the last ball?

Solution
The last ball will be red. The puzzle is about odds and evens. For instance you pick a red and blue ball, you will place red ball back inside. The red balls will always be in odd numbers. Hence, the last one will be a red ball.

7. Crossing the Bridge Puzzle

Four people need to cross a rickety bridge at night. Unfortunately, they have only one torch and the bridge is too dangerous to cross without one. The bridge is only strong enough to support two people at a time. Not all people take the same time to cross the bridge. Times for each person: 1 min, 2 mins, 7 mins and 10 mins. What is the shortest time needed for all four of them to cross the bridge?

Solution
It is 17 mins.
1 and 2 go first, then 1 comes back. Then 7 and 10 go and 2 comes back. Then 1 and 2 go again, it makes a total of 17 minutes.

8. Placing coconuts in a line

Your task is to place 10 coconuts in 5 lines such that each line has 4 coconuts.

Solution
You have to place them in a star shape with the centre being a pentagon. Each coconut will be placed at the intersection and meeting point of 2 lines.

9. Who's married and who's not?

Three people are in a room. Rahul looks at Nisha. Nisha looks at Sahil. Rahul is married but Sahil is not married. At any point, is a married person looking at an unmarried person? Yes, No or Cannot be determined.

Solution
Yes, at every point there is a married person looking at an unmarried person. The only person whose information we don't know is Nisha. Assume Nisha is married, she is looking at Sahil. So, married person is looking at unmarried person. Now assume Nisha is unmarried, Rahul is looking at Nisha. So even then married person is looking at an unmarried person.

10. Burning Rope Problem

A man has two ropes of varying thickness (Those two ropes are not identical, they aren't the same density nor the same length nor the same width). Each rope burns in 60 minutes. He actually wants to measure 45 mins. How can he measure 45 mins using only these two ropes.
He can't cut the one rope in half because the ropes are non-homogeneous and he can't be sure how long it will burn.

Solution
He will burn one of the rope at both the ends and the second rope at one end. After half an hour, the first one burns completely and at this point of time, he will burn the other end of the second rope so now it will take 15 mins more to completely burn. so total time is 30+15 i.e. 45mins.