1. **You are standing in a school hallway lined with 100 closed lockers. You then open all 100 lockers. After this, you then close every 2nd locker (so the 2nd, 4th, 6th…98th and 100th are all closed). Then, you go to every third locker and open it if it is closed or close it if it is open (let’s call this toggling the locker for our discussion). You proceed to toggle every nth locker on pass number n. So, for example, on pass number 16 – you will toggle every 16th locker. After your hundredth pass of the hallway, in which you toggle only locker number 100, how many lockers are now open?**

In a hall with x lockers, how many lockers remain open after pass number x?

1. **You’ve got someone working for you for seven days and a gold bar to pay him. The gold bar is segmented into seven connected pieces. You must give them a piece of gold at the end of every day. What and where are the fewest number of cuts to the bar of gold that will allow you to pay him 1/7th each day?**

Lets split the chain as,  
[](http://www.crazyforcode.com/wp-content/uploads/2013/07/gold-bar-cut.png)  
Day 1: Give A (+1)  
Day 2: Get back A, give B (-1, +2)  
Day 3: Give A (+1)  
Day 4:Get back A and B, give C (-2,-1,+4)  
Day 5:Give A (+1)  
Day 6:Get back A, give B  (-1,+2)  
Day 7:Give A (+1)

What if worker decides to spend his gold piece on Day 1?

If the worker spends his gold everyday, your "give back" trick doesn't work. In that case, you will need 4 cuts to accomplish the payment: First day you cut 1/7, leaving 6/7 fo the bar. The next day you do 1 cut longwise and then 2 cuts one third of the bar, leaving 6 equally sized chunks, the pay for the next 6 days.

1. **A car has 4 tyres and 1 spare tyre. Each tyre can travel a maximum distance of 20000 kilometers before wearing off. What is the maximum distance the car can travel. You are allowed to change tyres (using the spare tyre) unlimited number of times.**

Note: All tyres are used upto their full strength.

25000

Divide the lifetime of spare tire into 4 equal part i.e., 5000 and swap it at each completion of 5000 Kms distance.

Let four tyres be A, B, C and D and spare tyre be S.

5000 KMs: Replace A with S.

10000 KMs: Put A back to its original position and replace B with S

15000 KMs: Put B back to its original position and replace C with S

20000 KMs: Put C back to its original position and replace D with S

[Trains and Birds](http://www.mytechinterviews.com/trains-and-birds)

**Question:** A train leaves City X for City Y at 15 mph. At the very same time, a train leaves City Y for City X at 20 mph on the same track. At the same moment, a bird leaves the City X train station and flies towards the City Y train station at 25 mph. When the bird reaches the train from City Y, it immediately reverses direction. It then continues to fly at the same speed towards the train from City X, when it reverses its direction again, and so forth. The bird continues to do this until the trains collide. How far would the bird have traveled in the meantime?

**Answer:**Yes, you read it right. The bird is actually the fastest moving object in the problem!

Knowing that the bird is the faster than both the trains, you would only imagine that theoretically, the bird could fly an infinite number of times between the trains before they collide. This is because you know that no matter how close the trains get, the bird will always complete its trip before the crash happens. At the time of the crash, the bird would probably get squashed between the trains!

I bet sometime in school, you learnt how to sum up an infinite series. But do we have to do that?

The concept of relative speed (rings a bell?) can work handy here. Let’s assume that the distance between City X and City Y is **d** miles. The trains are approaching each other at a relative speed of (20 + 15) = 35 mph. The sum of the distances covered by the trains when they collide is d (i.e. the distance between the cities). Since distance/speed gives us time, we know that the trains collide d/35 hours after they start.

Since the speed of the bird is constant at 25 mph, we know that the bird would have covered

25 \* (d/35) miles = **5d/7 miles**

before the trains collide.