[**Infosys Sample Problems On Numbers And Digits**](http://www.careersvalley.com/infosys-sample-problems-numbers-and-digits)

**Question 1** Find the number of possibilities for a 4 digit number such that 3rd digit is 5 more than the 2nd digit which is 2 less than the first digit and the first digit is twice the last.

a) 1 b) 2 c) 3 d) cannot be determined.

**Answer :** c) 3

Solution :

Let the required number be abcd

According to the given conditions the following relations can be obtained:  
1) c = 5 + b => c - b = 5  
2) b = a - 2 => a - b = 2  
3) a = 2d

Let us look at all possibilities that satisfy the relation c - b = 5

b c

4 9

3 8

7 2

6 1

5 0

Let us look at all possibilities that satisfy the relation a - b = 2

a b

8 6

6 4

4 2

2 0

From the above two set of possibilities, the common possibilities are

a b c

6 4 9

4 2 7

2 0 5

From the 3rd condition a = 2d, the number may be 6493 or 4272 or 2051  
Therefore we have 3 numbers satisfying the given conditions.  
Hence there are 3 possibilities.

**Question 2** Find the largest five digit number whose 4th digit is 2/3 of the 5th digit and thrice of the 4th digit is 3rd digit and there are exactly 2 pairs of digits where difference between the numbers in each pair is 6.

a) 99623 b) 99485 c) 99678 d) 99523

**Answer :** a) 99623

Solution :

4th digit is 2/3 of the 5th digit, so the 5th digit should be a multiple of 3.  
The possibilities of 4th and 5th digits are  
1) 2, 3  
2) 6, 9  
3) 4, 6

The 2nd condition states that thrice of 4th digit is 3rd digit.  
The 2nd and 3rd possibilities are ruled out since 18, 12 cannot be the digit of that number.  
And the thrice of 2 is 6 which is the 3rd digit  
So 3rd digit is 6, 4th digit is 2 and 5th is 3.

Since, We have to find the greatest 5 digit number, the 1st and 2nd digit may be 9.

And so, the number may be 99623.

By checking the 3rd condition that there is exactly 2 pairs of digits whose difference is 6.  
i.e., 1st digit - 5th digit = 6 and 2nd digit - 5th digit = 6 and we have no other choices.

Hence the answer is 99623.

**Question 3** Find a 5 digit number such that if we multiply the 1st two digits we get 3rd digit, 3rd digit is twice that of 2nd digit, the sum of the 4th and 5th digit is one less than 3rd, 1st is 2 less than the 2nd and 1st double the last digit.

a) 24856 b) 24861 c) 24835 d) 24895

**Answer :** b) 24861

Solution:

Let abcde be the required number.

Write an equation for each statement as follows:

"if we multiply the 1st two digits we get 3rd digit" i.e., ab = c  
"3rd digit is twice that of 2nd digit" i.e., c = 2b  
"the sum of the 4th and 5th digits is one less than 3rd" i.e., c = d+e+1  
"1st is 2 less than the the 2nd " i.e., a = b - 2  
"1st double the last digit" i.e., a = 2e.

Let's see if we can sort something out with the 1st eqn,  
replace c with 2b(from the 2nd eqn)  
ab = 2b  
a = 2  
Then from the last eqn,  
a = 2e  
e = 1

And from the 4th eqn we have a = b-2 ==> b = 4.

Using the 1st eqn, ab = c ==> c = 8.

Finally from the 3rd eqn, c = d+e+1 ==> d = 6.

Therefore a = 2, b = 4, c = 8, d = 6 and e = 1

Hence the number is 24861.

## [Infosys Sample Data Structures Questions](http://www.careersvalley.com/infosys-sample-data-structures-questions)

**Question 1** Why it is more expensive to insert elements in the middle of an array compared to that of a linked list?

**Answer :**Whenever an element has to be inserted in an array, all the remaining elements have to be moved in memory to accommodate the new element. But in case of linked list, only the address pointers of the adjacent elements will be affected.  
(For example, if an element has to be inserted into 5th position of a singly linked list, the address pointer of the 4th element will be changed to point to the location of our new element. Then the address pointer of our new element will point to the location of the original 5th element.)

**Question 2** When the number of updates is very less or none, how an array can be advantageous over a linked list?

**Answer :** Though arrays require more operations when it comes to updates, they require lesser memory than linked list. Hence, when there are none or less number of updates, an array can be advantageous.

**Question 3** Tell any one important advantage array has over linked list when it comes to element access? You can explain your answer considering an example operation of reading an element at some fixed location from start?

**Answer :** An array offers a kind of random access to its elements. This is possible only because of the reason that the elements are contiguous in memory. For example, consider an array that has 5 elements. These 5 elements will be at contiguous memory locations. If a program wants to read the 4th element of the array, it knows very well that incrementing the address pointer 4 times relative to the first element will land it at the exact location of the 4th element. However, in case of a linked list, the program has to traverse element by element. After an element is encountered, based on the address pointer the program will move on to the next element and so on.

## [Infosys Sample Probability Puzzles On Time](http://www.careersvalley.com/infosys-sample-probability-puzzles-time)

**Question 1** From a railway junction RJ, trains leave from platforms P and Q for every 20 minutes and 30 minutes respectively. Assume all the trains travel with constant speed. The service from platform P starts at 6.00am and the service from platform Q at 6.05 am. Assume that you are waiting in a nearby station. Any train from RJ would require 5 minutes to reach your station. Now, what is the probability that you will be able to board a train from P in between 6 and 6.30 am.

a)2/3 b)1/3 c)1 d)1/4

**Answer :** a)2/3

Solution :

**From Platform P**

The first train will leave by 6 am and reach your station in 5 minutes, i.e. at 6.05 am  
Second train will leave after 20 minutes i.e at 6 am and reach your station at 6.25 am

**From Platform Q**

The first train will leave by 6.05 am and reach your station at 6.10 am.  
Second train will leave after 30 minutes i.e at 6.35 am and reach your station at 6.40 am.

**Inference.** Between 6 and 6.30 am, first and second trains from P and first train from Q will reach your station. In other words, you will be able to board 2 trains from P and 1 train from Q.

Therefore, probability that you will board a train from P = Trains from P between 6 and 6.30 / Total Trains from P and Q between 6 and 6.30 = 2/3

**Question 2** From a bus stand, buses leave for every 15 minutes to both temple and Railway junction. First bus towards junction is at 7.00 am and towards temple is at 7.10 a.m. Suppose you have to visit both temple and junction and decide to go by the first bus you encounter. Then the probability to get a bus towards temple is \_\_\_ .

a)0.67 b)0.5 c)0.75 d)0.33

**Answer :** a)0.67

Solution :

Let us discuss an interesting method to solve such problems :

Let's simulate a 60 minute time period:  
A period of 60 Minutes broken into intervals of 5 minutes each:  
0 - 5 - 10 - 15 - 20 - 25 - 30 - 35 - 40 - 45 - 50 - 55 - 60(or "0" again)  
Arrival of BUS : ( t = temple, j = junction, X = no bus arrives at that particular time)  
j - X - t - j - X - t - j - X - t - j - X - t - j

TO MAKE IT EASY TO UNDERSTAND WE HAVE WRITTEN THE SAME THING AGAIN.

0 - 5 - 10 - 15 - 20 - 25 - 30 - 35 - 40 - 45 - 50 - 55 - 60

j - X - t - j - X - t - j - x - t - j - x - t - j

0 10 5 10 5 10 5 10 5

The line written immediately above (that is the 3rd line of data) has numbers corresponding to "t" and "j" which shows how many minutes a person has to wait till he gets the "First bus".

Therefore,

t= 10 + 10 + 10 + 10 = 40 Minutes  
j= 0 + 5 + 5 + 5 + 5 = 20 Minutes

Therefore in 40 minutes of standing time for the bus you will get t bus and in 20 minutes of standing time for the bus you will get j bus.  
You will also see that this is the schedule for every hour after 7.00 A.M.

This means that the probability to get t bus is = 40 Minutes / 60 Minutes = 2/3 = 0.67  
Also the probability to get j bus is = 20 Minutes / 60 Minutes = 1/3 = 0.33

Hence the answer is 0.67

**Question 3** A man has to go to both Pune and Mumbai. He decides to go by whichever first train he encounters. The first train towards Pune is at 8:00 am and the frequency of Pune trains is 10 minutes. The first train towards Mumbai is at 8:10 am and the frequency of Mumbai trains is 15 minutes. Assume that the man arrives at railway station at a particular time between 8 and 9 am. What should be his exact arrival time at the station that will leave him really confused on whether to go Pune or Mumbai.

a)9.00am b)9.10am c)8.40am d)8.25am

**Answer :** c)8.40am

Solution :

The man plans to go by first train he encounters. Hence at times when only one of the trains leave, he will never get confused. But if his arrival time is greeted by both the trains (one to Pune and one to Mumbai) starting simultaneously the man will surely be confused.

First train to Pune is at 8 am and the frequency is 10 minutes.  
Therefore Pune trains will leave at the following times : 8 am, 8.10am, 8.20am, 8.30am, 8.40am, 8.50am and so on.

First train to Mumbai is at 8.10 am and the frequency is 15 minutes.  
Therefore Pune trains will leave at the following times : 8.10 am, 8.25am, 8.40am, 8.55am, 9.10am and so on.

At 8.40am both the trains will leave simultaneously. This is the time at which the fellow can really be confused.

**[Infosys Logical Statements Interpretation Sample Questions](http://www.careersvalley.com/infosys-logical-statements-interpretation-sample-questions" \o "Infosys Logical Statements Interpretation Sample Questions)**

**Question 1** Raman, Krishnan and Govindan are close friends. One day Raman told the below lines to his two friends:  
Of all pets I have, except 4, all are dogs  
Of all pets I have, except 4, all are parrots  
Of all pets I have, except 4, all are Goldfish  
How many dogs , parrots and Goldfish are there with Raman?

a) 3 dogs,3 parrots ,3Goldfish  
b) 2 dogs,2 parrots, 2 Gold fish  
c) 4 dogs,4 parrots ,4 Gold fish  
d) none of these.

**Answer :** b) 2 dogs,2 parrots, 2 Gold fish

Solution :

All the statements said by Raman will be true only if he has 2 dogs, 2 parrots and 2 gold fish. i.e There are 6 pets in total with 2 of each kind. This means, except 6 - 2 = 4, all are of a particular kind. This is what is being said in all the statements.

**Question 2** Akbar told his friends Amar and Antony that he is fond of possessing multiple cell phones and added as follows:  
OF all cell phones I have, except 6, all are Nokia cell phones  
OF all cell phones I have, except 5, all are Samsung cell phones  
OF all cell phones I have, except 7, all are LG cell phones.  
How many Nokia, Samsung and LG cell phones?

a) 2 Nokia cell phones, 2 Samsung cell phones and 2 LG cell phones  
b) 3 Nokia cell phones, 2 Samsung cell phones and 3 LG cell phones  
c) 3 Nokia cell phones, 4 Samsung cell phones and 2 LG cell phones  
d) 3 Nokia cell phones, 3 Samsung cell phones and 3 LG cell phones

**Answer :** c) 3 Nokia cell phones, 4 Samsung cell phones and 2 LG cell phones

Solution :

Again this question has to be solved by looking at options one by one. While we are leaving the exercise of inspecting each option for your practice, we will just see why option c is right.  
Option c states that there are 3 Nokia cell phones, 4 Samsung cell phones and 2 LG cell phones.

The above option implies the below three things :  
i) Except 3 Nokia + 4 Samsung = 7 cell phones, all the remaining 2 are LG cell phones  
ii) Except 3 Nokia + 2 LG = 5 cell phones, all the remaining 4 are Samsung phones  
iii) Except 2 LG + 4 Samsung = 6 cell phones, all the remaining 3 are Nokia phones.

All the above three interpretations coincide exactly with those given in question. Hence option c has to be right.

**Question 3** Before the marriage, Saravanan told Meenakshi as follows,  
Of all the independent houses I own, except 10 all are two bed room houses  
Of all the independent houses I own, except 10 all are three bed room houses  
Of all the independent house I own, except 10 all are single bed room houses.  
How many two bed room / three bed room / single bed room houses did Saravanan own?

a) 10 two bed room, 10 three bed room and 10 single bed room houses  
b) 5 two bed room, 5 three bed room and 5 single bed room houses  
c) 5 two bed room, 10 three bed room and 5 single bed room houses  
d) None of these.

**Answer :** b) 5 two bed room, 5 three bed room and 5 single bed room houses

Solution :

This question is very much similar to the first question and is much easier than second question.  
Saravanan owns 5 two bed room houses, 5 three bed room houses and 5 single bed room houses and that is why he says “Of all the independent houses I own, except 10 all are two bed room houses and so on…”