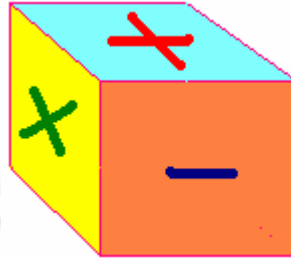
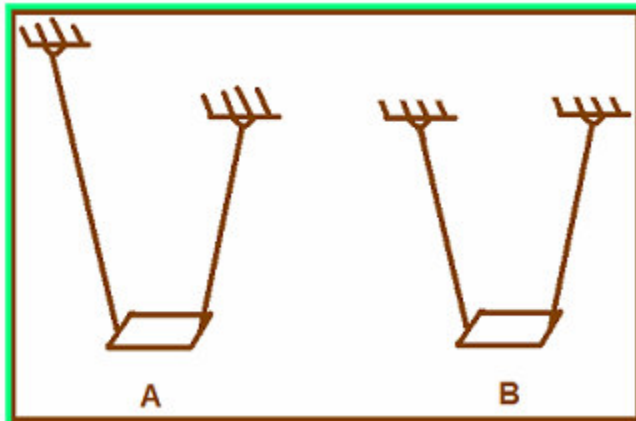


## Mathematrix



In this issue of Mathematrix, we are trying to explain how much time we can save by using simple formulas in mathematics. We are trying to share our experiences of 'Srinivasa Ramanujan Mathematics Club' conducted by 'Sanghamitra' during June and July of this year (2005). You might ask 'who is Srinivasa Ramanujan?' Ramanujan became member for Royal Society and Trinity College at an early age and earned worldwide fame. For more details, refer 'Noted people in History' article in Sanghamitra October 2004 issue. The motto of this club is to accelerate the students math skills, increase their confidence. To achieve this, we discussed problem solving techniques, techniques to sharpen the brain capability, some vedic mathematics tips. Hope you enjoy these tips and encourage this kind of articles in future.

Do we spend a single day without using mathematics? No surprise, if we say starting from the time we wakeup to the time we go to bed, we use mathematics (directly or indirectly) each and every minute. In the morning when we wakeup, we think about the date, day, month. If we plan to go to a friend's place, we check time, we think how long will it take to reach friend's house, then we calculate the probable time we can reach friend's place automatically.



Now if we think about a park having a slide, swing etc., mathematics is necessary to construct those utilities. If you construct a swing like the one in picture A, what happens? It swings unevenly. But, if you construct a swing like the one in picture B, it swings properly. This way mathematics takes part in every step and It is important for us to learn some tips. In the below few examples, check the ways to do addition, subtraction, multiplication and division quickly.

Q. Can you find the sum of numbers from 1 to 100?

A. If you know the formula  $n(n+1)/2$ , you multiply 100 by 101 and divide it by 2 to get the answer.

But I do not know multiplication. What should I do?  
Simple!

Arrange  $1 + 2 + 3 + \dots + 97 + 98 + 99 + 100$  in a different way like  $(1 + 99) + (2 + 98) + (3 + 97) + \dots + (49 + 51) + 50 + 100$ . Any problem? Now add 1 and 99 to get 100, 2 and 98 to get 100, 3 and 97 to get 100, ..., 49 and 51 to get 100, 50 and a 100. So the sum of numbers is nothing but 49 hundreds + 50 + 100, which is equal to  $4900 + 50 + 100 = 5050$ . You can see the solution in picture beside this.

$$\begin{aligned}
 &1 + 2 + 3 + \dots + 97 + 98 + 99 + 100 = ? \\
 &= (1 + 99) + (2 + 98) + (3 + 97) + \dots + (49 + 51) + 50 + 100 \\
 &= \underbrace{100 + 100 + \dots + 100}_{49 \text{ times}} + 50 + 100 \\
 &= 5050.
 \end{aligned}$$

Q. I am looking for sum of numbers from 51 to 100. Can you find it?

A. You know the sum of numbers from 1 to 100. Now find the sum of numbers from 1 to 50 and deduct it from sum of 100 numbers. Now the sum of numbers 1 through 50 is  $(1 + 49) + (2 + 48) + (3 + 47) + \dots + (24 + 26) + 25 + 50 = 24 \text{ Fifties} + 25 + 50 = 1200 + 25 + 50 = 1275$ . So the sum of numbers from 51 to 100 is  $5050 - 1275 = 3775$ .

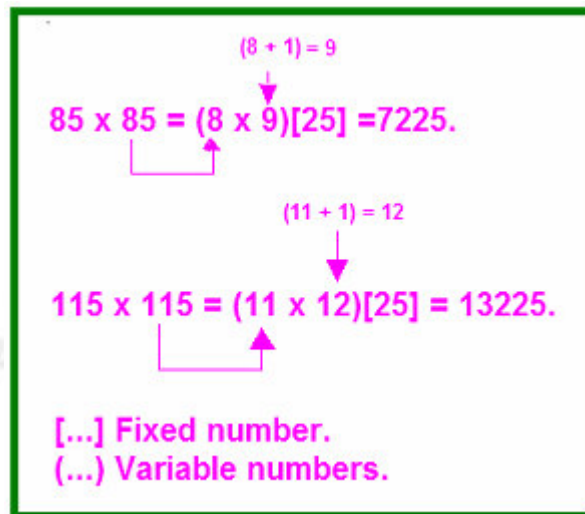
Vedic mathematics is brought into this world by Sri. Bharati Krishna Teertha (1884 – 1960). The 16 volumes written by him explaining the 16 formulas were lost. Later he wrote one volume covering all the 16 formula. We are trying to bring up those formulas along with other different techniques.

**By one more than the one before :** Using this formula we can find the squares of a number ending with 5.

The square of a number ending with 5, consists 2, 5 in tens and units place respectively. Now the number leaving five is to be multiplied by the next number and should be written in hundreds and other positions.

For example, to find 85 square,  $(8 \times 9) = 72$  should be placed in thousands' and hundreds' place, and 25 should be placed in tens and units place. So the square of 85 is 7225.

Similarly, for 115 square,  $(11 \times 12) = 132$  fills ten thousands', thousands' and hundreds' place and 25 fills tens' and units' place. So the square of 115 is 13225. For detail explanation see adjacent figure.



Are you thinking that easy? Yes. It is so simple. Try to find squares for some more number ending with 5. Try, try and try, you will learn at last.

Let's try to keep calculators aside for a moment  
and sharpen our brains

Let's use the above formula  
Achieve the result in no time.

$$105^2 = ?$$

$$205^2 = ?$$

$$75^2 = ?$$

$$45^2 = ?$$

( to be continued in the Sankranti issue. Let us meet again. )

The real danger of computer age is  
not that computer will think like people,  
but that people will think like computer.