Maths Tricks for SSC CGL - Calculation and More

Preparing for the SSC CGL exam can be daunting, especially when it comes to mastering fast and accurate calculations. However, this blog is here to support you throughout your journey! We've compiled essential Math tricks for SSC CGL that will enhance your problem-solving speed and confidence. You'll also find practice questions to test your abilities, with detailed solutions to help you learn from mistakes and improve your understanding.

In need of study resources? We've included book recommendations specifically for SSC CGL preparation. Additionally, our expert tips will provide you with practical advice on time management, tackling tough problems, and focusing on key areas. Whether you're a beginner or refining your strategies, this blog offers the tools to help you excel in basic calculations and improve your performance in the Quantitative Aptitude section. Start now and move closer to your SSC CGL success!

Calculation Maths Trick SSC CGL - An Overview

You're not the only one—many of us encounter the same challenge during exams: tricky and time-consuming calculations. You might find yourself stuck on questions like 27 × 64 or 342, unsure whether to work through them manually or skip them to save time.

To make things easier, here are some clever methods to speed up your calculations. These aren't shortcuts but smart strategies that help you do most of the work mentally, cutting down on time and effort. However, just like perfecting any skill, these techniques take practice—a lot of it.

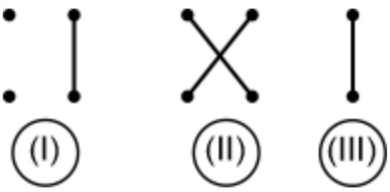
Let's jump in and explore how useful and interesting these tricks can be!

Maths Trick SSC CGL - Single and Double Digit Multiplication

We can easily handle single-digit or single-digit by double-digit multiplication, but things get tricky with two-digit numbers like 87 and 63. For instance, let’s multiply 21 and 47.

One way to do this is by multiplying 47 by 20 (since 21 is close to 20), getting 940, and then adding 47: 940 + 47 = 987. While this works, it can still feel slow and only works with numbers near multiples of 10.

Now, here's a faster trick to multiply two-digit numbers in one line using three simple steps, doing most of the work in your head.



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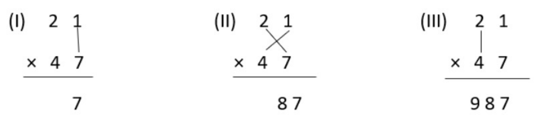
- (I-step) multiply the unit digits and write the unit digit of the answer (say d) (carry the tens digit (if any))
- (II-step) Cross multiply the digits (i.e. unit digit of first no. with tens digit of second number and vice versa) and add them (add the carried quantity too (if any)) and write the unit digit of the answer (say c) and carry the remaining number (if any)
    - [Note: Since these are just two-digit numbers to add, it can be done in our mind, there is no need to write them]
- (III-step) Multiply the tens digits and add the carried quantity (if any) and write the answer (say ab)

So, **abcd** is your answer.

Let's take the above example and see how it works.



Explanation

(I) unit digits, 1 × 7 = 7
(II) cross multiplication, 7 × 2 = 14 & 4 × 1 = 4 and 14 + 4 = 18 (so 8, and 1 carry)
(III) tens digits, 4 × 2 = 8 and 8 + 1 = 9
So, 987 is the ans.

Squares and Square Roots Calculation Tricks

Trick 1: Use Known Squares
You can find the square of a number by using the square of another. The formula is:
$(n + 1)^2 = n^2 + 2n + 1$

or

$(n+1)^2 = n^2 + n + n + (n + 1)$

Let's focus on numbers between 1 and 100. Assuming you already know the squares of 10, 20, 30, and so on, let's move to a simple method for squaring numbers that end in 5.

Squaring Numbers Ending in 5

To square these numbers, take the tens digit (or the digits before the 5), multiply it by the next consecutive number, and then append 25 to the result.

Example 1: 35^2: Take 3, multiply by 4 (next number), and get 12. Add 25, so the answer is 1225.

Example 2: 65^2: Take 6, multiply by 7, getting 42. Add 25, so the answer is 4225.

Example 3: 125^2: Take 12, multiply by 13, getting 156. Add 25, so the answer is 15625.

This trick can be applied to any number ending in 5!

Now, we can apply the general formula for any square. Let's take some examples.

Example 4: 36^2 ?

Ans- According to the formula,
$36^2 = 35^2 + 35 + 36 = 1225 + 71 = 1296$.

Example 5: 41^2 ?

$41^2 = 40^2 + 40 + 41 = 1600 + 81 = 1681$.

Example 6: 79^2?

Here, we can use another general formula of algebra,

$a^2 - b^2 = (a + b)(a - b)$

For a and b consecutive integers, a – b is always 1.

So, we can say that, the difference between the squares of two consecutive integers is the sum of the two integers.
So, $80^2 - 79^2 = 80 + 79$

Which means, 792 = 802 – 80 – 79 = 6400 – 159 = 6241.

Trick 2- Let's just write the squares of numbers from 1 to 50 and find if there is something common.

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1	121	441	961	1681
4	144	484	1024	1764
9	169	529	1089	1849
16	196	576	1156	1936
25	225	625	1225	2025
36	256	676	1296	2116
49	289	729	1369	2209
64	324	784	1444	2304
81	361	841	1521	2401
100	400	900	1600	2500

Here, we can see some interesting pattern. After 25^2, the last two digits of squares are repeating correspondingly (i.e. last two digits of $(25 + n)^2$ = last two digits of $(25 – n)^2$, where n ≤ 25)
It means, last two digits of 44^2 = last two digits of 6^2,

Last two digits of 33^2 = last two digits of 17^2 (and rest of the number from 17^2 will be carry for further calculation), and so on.

So to find the square of any number from 1 to 125, we have to remember the squares from 1 to 25.

Now, let's split this into two parts. In the first part, we will talk about squares from 25 to 75. In the second part, we will talk about squares from 75 to 125.
[Note: The pattern of the last two digits for the next fifty numbers and further next fifty numbers and so on will be the same as the first fifty numbers]

Part 1 - Square of numbers from 25 to 75

For now, we know the last two digits of the number. So, for the first two digits (or three digits), we subtract the main number from 50 and then subtract the outcome from 25 (and also add the remaining number which was carried from the square). It seems a little bit complicated. Let's see some examples.

Example 7: 34^2?

The last two digits will be same as the last two digits of 162. i.e. 56. (∵ 34 – 25 = 25 – 16). But 162 = 256, so 2 will be carry from here

For first two digits, 50 – 34 = 16. So, 25 – 16 = 9 and then we add that carried number, i.e. 2

So, 9 + 2 = 11. So the answer is 1156.

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Example 8: 73^2?

The last two digits will be same as the last two digits of 232. i.e. 29. But 232 = 529, so 5 will be carry.

For the first two digits, 50 – 73 = -23. So, 25 – (-23) = 48,

Now, 48 + 5 = 53. So, the answer is 5329.

Part 2 - Square of numbers from 75 to 125

For now, we know the last two digits of the number. So, for the first two digits (or three digits), we subtract the main number from 100 and then subtract the outcome from the main number (and also add the remaining number which was carried from the square). In other words, we subtract the main number from 100 and then subtract double of the outcome from 100 (and add the carried quantity).

Let's see some examples.

Example 9: $92^{2?}$

The last two digits will be same as the last two digits of 422. i.e. last two digits of 82. (∵ 42 – 25 = 25 – 8). i.e. 64.

For the first two digits, 100 – 92 = 8. So, 92 – 8 or 100 – (8 × 2) = 84.

So the answer is 8464.

Example 10: 117^2?

The last two digits will be the same as the last two digits of 172. i.e. 89.

But 172 = 289, so 2 will be carried from here,

For the first two/three digits, 100 – 117 = -17, So, 117 – (-17) = 134. Also, 134 + 2 = 136.

So, the answer is 13689.

As mentioned earlier, it may seem complicated at first, but with practice, you'll find it much easier over time.

Now that we've covered squares, let's move on to square roots. While there are methods like factorization and the square root method, they can be quite long and complex. I'm going to show you a quick way to find the square root of a perfect square. Keep in mind that this trick only works for perfect squares, so make sure the number is a perfect square before applying it!

So, let's take some examples and find out the way.
But before that, just remember the pattern. The last digit of square of 1 and 9 is 1.

- The last digit of square of 2 and 8 is 4.
- The last digit of square of 3 and 7 is 9.
- The last digit of square of 4 and 6 is 6.
- The last digit of square of 5 is 5.
- The last digit of square of 0 is 00.

So, any number ending with the digit 2, 3, 7, 8, and an odd number of 0s will never be a perfect square.

Example 11: Find the square root of 9409.

Just a reminder, this method works only for perfect squares. Avoid using this trick if you're unsure whether the number is a perfect square. We'll cover the properties of perfect squares later in the "Number System" section.

We can estimate the square root of a number by comparing it to the squares of two nearby numbers—one greater and one smaller. Let's take 50 and 100 as examples. We know 100^2 =10,000 and
50^2 =2,500. Since 9409 is much closer to 10,000 than 2,500, let's try 90.

90^2 =8,100, so now we know 8,100 < 9,409 < 10,000. So, 8,100<9,409<10,000. Since 9,409 is closer to 10,000, the square root is likely between 95 and 100. The only number in that range whose square ends in 9 is 97.

Thus, the square root of 9,409 is 97.

Example 12: Find the square root of 17689.

Square greater than 18000 will be 19600 which is 140^2. And 130^2 = 16900. So the answer lies between 130 and 140. But 17689 seems close to 16900. So our answer lies between 130 and 135. And 133 is the only number that can give us 9 as the last digit by squaring itself.

So the answer is 133.

Example 13: Find the square root of 17689.

Square greater than 18000 will be 19600 which is 1402. And 1302 = 16900. So the answer lies between 130 and 140. But 17689 seems close to 16900. So our answer lies between 130 and 135. And 133 is the only number that can give us 9 as the last digit by squaring itself.

So the answer is 133.

Maths Trick for SSC CGL - Square Roots of Non-Perfect Squares

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Now, we are going to share the jackpot trick for finding the "square roots of non-perfect squares" quickly. While this trick won't give you the exact square root (since some square roots are irrational, like √2, and can't be expressed exactly), it will help you get a close estimate in a very short time.

But, this trick will give you the approximate answer which is too close to the actual answer. And, also, you can find square root of any number in just 4 or 5 seconds. Hence, learning this trick is worth it.

For this trick, we have to learn a small formula.

i.e. $\sqrt{x \pm y} = \sqrt{x} \pm \frac{y}{2\sqrt{x}}$

So, the trick is you have to break the number into sum of two numbers or difference of two numbers in which bigger number should be a perfect square. And then apply this formula.

Example 14: Find the approx. value of √17.

We can write 17 = 16 + 1. We have done it because 16 is a perfect square. Now, just put 16 in place of x and 1 in place of y.

$\Rightarrow \sqrt{16+1} = \sqrt{16} + \frac{1}{2\sqrt{16}}$ = 4 + 1/8 = 4 + 0.125 ≈ 4.125

The exact answer is 4.12310563

Example 15: Find the approx. value of √111.

We can write 111 = 100 + 11. Now, apply the formula,

$\Rightarrow \sqrt{100+11} = \sqrt{100} + \frac{11}{2\sqrt{100}}$ = 10 + 11/20 = 10 + 0.55 ≈ 10.55

Also,

We can write 111 = 121 – 10. Now, apply the formula,

$\Rightarrow \sqrt{121-10} = \sqrt{121} - \frac{10}{2\sqrt{121}}$ = 11 – 10/22 = 11 – 0.4545 ≈ 10.5454

The exact answer is 10.5356538.

So, as you can see, there is a very small change in the approx. value and actual value. This change is not big enough to provide some difficulty in your final answer or give you whole another answer. Also, this is time time-saving trick.

Multiplication Calculation Tricks - Double and Triple Digit

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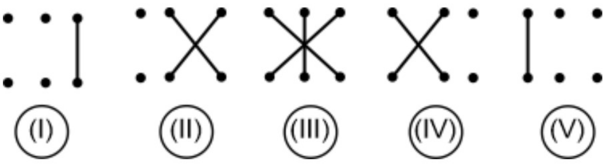
Let's talk about the multiplication of two three-digit numbers. See, the reason to put this calculation in the expert section is that it is a little bit difficult to digest and also, there are very rare chances that the multiplication of two three-digit numbers will come in the exam.

Now, when we see the numbers like 367 and 824, first thing comes in our mind is that can we multiply these numbers in one line? So the answer is, yes we can. Let's check how.

It requires 5 simple (not really) steps.



The explanation of these 5 steps is the same as the explanation of two-digit multiplication. Let's take an example and try to understand.

Example 16: 367 × 824?

(I)	(II)	(III)	(IV)	(V)
3 6 7	3 6 7	3 6 7	3 6 7	3 6 7
× 8 2 4	× 8 2 4	× 8 2 4	× 8 2 4	× 8 2 4
8	0 8	4 0 8	2 4 0 8	30 2 4 0 8

Explanation
(I) 7 × 4 = 28 (so 8 and 2 carry)
(II) 6 × 4 = 24 & 7 × 2 = 14 and 24 + 14 = 38 and 38 + 2 = 40 (so 0, and 4 carry)
(III) 3 × 4 = 12 & 7 × 8 = 56 & 6 × 2 = 12. So, 12 + 56 + 12 = 80 and 80 + 4 = 84 (so 4, and 8 carry)
(IV) 3 × 2 = 6 & 6 × 8 = 48 and 6 + 48 = 54 and 54 + 8 = 62 (so 2, and 6 carry)
(V) 3 × 8 = 24 and 24 + 6 = 30

So the answer is 302408.

Start with simple examples to practice, but remember, there are no shortcuts - practice is key to mastery. You may have seen people effortlessly handling complex calculations and thought they were gifted, but it's their extensive practice that makes them so skilled. Just like them, you can achieve the same proficiency through consistent practice. Embrace the challenge and turn this difficult aspect of calculations into one of your strengths.

In summary, mastering basic calculation techniques can greatly improve your performance in the SSC CGL exam. The strategies discussed in this blog are just a preview of the more detailed approaches available in "
Quant Sir
" by Raja Bhattacharjee. This book is packed with additional tips, tricks, and practice exercises that will help sharpen your skills and build confidence. For those aiming to further develop their quantitative aptitude, "Quant Sir" is an excellent resource, offering clear explanations and effective methods to elevate your preparation. You can even
preview
the book by clicking the embedded link. To take your SSC CGL preparation to the next level, we recommend exploring this

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