

Speed Up Your Calculation (Ganit Bodh Series)-05

Square root

Trick 1. For squaring any number which is made by 9's:

For example:

$$(999)^2 = 998001$$

Write (n-1) 9's and one 8 over there and then write 0's as many as 9's are written and finally, write one, where n is the total number of 9.

Consider other examples:

$$(99999)^2 = 9999800001$$

$$(99)^2 = 9801$$

$$(999999)^2 = 999998000001 \text{ etc.}$$

Trick 2. For finding square root of such type of numbers on the later arrangement write in answer 9's one more than the 9's one more than the 9's are present in the pattern.

For examples:

$$\sqrt{9801} = 99$$

$$\sqrt{998001} = 999$$

$$\sqrt{999998000001} = 99999$$

This is the required answer.

Trick 3. If you have to square numbers in which numbers are made by using unit only:

For example:

$$(1111)^2$$

Trick: Then write counting up to the number of 1's in increasing order and then in decreasing order.

For example:

$$(1111)^2 = 1234321$$

Since in the above number four 1's are there so, write counting starting from 1 to 4 in increasing order and then in decreasing order. Since here four 1's so write counting up to 4 in increasing order and then in decreasing order.

For example:

$$(11)^2 = 121$$

$$(111)^2 = 12321$$

$$(1111)^2 = 123454321 \text{ etc.}$$

To find the square root of pattern of the number given in RHS above, write 1's as many as the greatest integer used in the pattern.

For example:

$$\sqrt{12321} = 111$$

$$\sqrt{1234567654321} = 1111111$$

$$\sqrt{1234321} = 1111 \text{ etc.}$$

Speed Up Your Calculation (Ganit Bodh Series)-05

Cube root

Consider the following

$$1^3 = 1$$

$$2^3 = 8$$

$$3^3 = 27$$

$$4^3 = 64$$

$$5^3 = 125$$

$$6^3 = 216$$

$$7^3 = 343$$

$$8^3 = 512$$

$$9^3 = 729$$

$$10^3 = 1000$$

To find cube roots of any number which is perfect cube. For example. Suppose we have to find cube root of $\sqrt[3]{9261}$. then think that since cube roots of $\sqrt[3]{8000} = 20$ and $\sqrt[3]{27000} = 30$. Since number 9261 lies between 8000 to 27000. Hence cube root of $\sqrt[3]{9261}$ lies between 20 to 30. But we have to find such a number between 20 to 30 whose unit place could be 1 after making cube, which is possible only when unit place contains 1. Hence, the answer could be number which lies between 20 to 30 and unit place must be 1. So, required number is 21.

Consider another number $\sqrt[3]{15625}$ since the number 15625 lies between 8000 to 27000. Hence answer $\sqrt[3]{15625}$ lies between 20 to 30, whose unit place must be 5 after cubing it. Definitely answer will be 25. Consider the following examples and observe the answers.

To be continued....

@arbindsingh.com