

Formulae of Squares and Square Roots



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Here is a new and short way to find the square of a given number if the square of the predecessor and successor is given.

To find the square of next number we add a particular odd number. If we know the square of x and we have to find the square of next number then we add the odd number which is in the place of the next number of x . E.g. if we know the square of 10 then we can find the square of the next number which is 11. We will add the 11th odd number to square of 10.

Example

First step- $(10)^2 + 11^{\text{th}}$ odd number = $(11)^2$

Second step- $100 + 21 = (11)^2$

Third step- $121 = (11)^2$

Formula in terms of x

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

To find the square of previous number we subtract a particular odd number. If we know the square of x and we have to find the square of previous number then we subtract the odd number which is in the place of the previous number of x . E.g. if we know the square of 11 then we can find the square of the previous number which is 10. We will subtract the 11th odd number to square of 11.

Formula

First step- $(11)^2 - 11^{\text{th}}$ odd number = $(10)^2$

Second step- $121 - 21 = (10)^2$

Third step- $100 = (10)^2$

Where x is any positive integer

$$(x-1)^2 = x^2 - 2(x-1) + 1$$

Short cut for odd numbers- If we have to find a big odd number then we double the predecessor number because 1st odd number is 1 and the 1st even number is 0 so odd numbers are 1 point bigger than the even numbers occurring at same place.

E.g. 20th odd number is 39 and 20th even number is 38 so the odd number occurring at the same place is bigger than the even number in that same place. Here place means the position where they lie.

E.g. they both lie in the 20th place. (as per example above).

E.g. of Short cut for odd numbers - 124th even number is 246. We doubled the predecessor 124 to get the 124th even number.

First step- 124th even number = $2(124-1)$

Second step- 124th even number = $2(123)$

Third step- 124th even number = 246