Chapter 6

Squares & Square Roots

Square roots of Decimals:

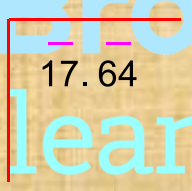
The long division method used to find the square root of decimal numbers is the same as that used for the whole numbers. The only difference lies in pairing the digits.

The digits are paired separately for the whole number (integral) part and the decimal part.

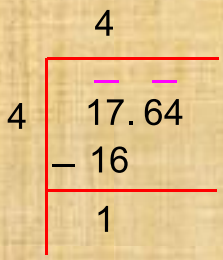
Example:

Find the square root of 17.64.

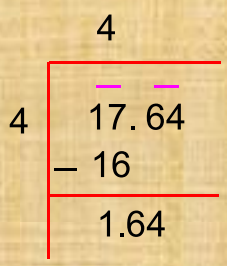
Step (1): Place the bars on the integral part of the number i.e. 17 in the usual manner. Place the bars on every pair of decimal part from left to right.



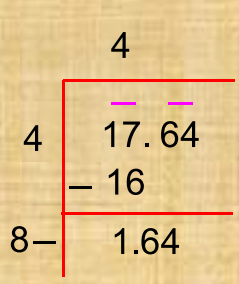
Step (2): Find the largest number (i.e. 4 x 4 = 16) whose square is less than or equal to the first pair of integral part (i.e. 17). Take this number '4' as a divisor and the first pair 17 as the dividend. Get the remainder as 1.



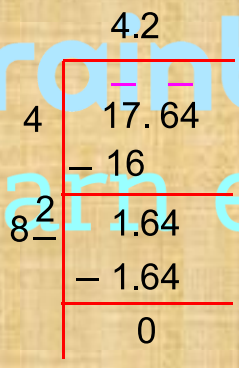
Step (3): Write the next pair (i.e. 64) to the right of the remainder to get 164, which becomes the new divided.



Step (4): Double the quotient (2 x 4 = 8) and write it as '8' in the box on its right. Since 64 is the decimal part. So, put a decimal point in the quotient (i.e. 4)



Step (5): Guess the digit to fill the gap in such a way that the product of the new divisor and the digit is equal to or less than the new dividend 164. In this case the digit is '2'. Divide and get the remainder.



Step (6): Since the remainder is zero and no pairs left.

$\therefore \sqrt{17.64} = 4.2$

Note:

- It there are odd number of decimal places in a number, then it is made even by adding the required number of zeros.
- If the integral part is zero in the given decimal number. Then the integral part in the square root is also zero.
- If the first pair after the decimal point is 00. Then, the first digit after decimal in the square root is also zero.