SQUARES AND SQUARE ROOTS

FINDING SQUARE ROOT BY DIVISION METHOD

Division Method

The number of digits can be determined by placing bars on every pair of digits starting from units digit.

If the number of digits are odd then the left most single digit will have a bar on it. The number of bars give the number of digits in the square root of the number. For example : square root of $\overline{20}\,\overline{25}$ will have

2 digits whereas $\sqrt{\overline{27}\,\overline{22}\,\overline{5}}$ has 3 digits.

Steps of Division Method:

(i) Place a bar over every pair of digits starting from the units digit.

(ii) Find the largest number whose square is less than or equal to the number under the left most bar.

(iii) Take this number as the divisor and number under left most bar as dividend. Divide them to get the remainder. You will see that in this step the divisor and quotient are same.

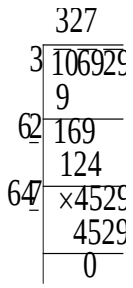
(iv) While down the number under next bar at the right side of the remainder. This is our new dividend.

(v) New divisor is obtained by adding the quotient in the divisor obtained in step (iii) and putting a suitable digit at the right of it . The digit is chosen in such a way that its product with new divisor is equal or just less than new dividend.

Repeat steps (iv) and (v) till all bars have been considered. The final quotient is the square root of the given number.

Ex.1 Find square root of 106929.

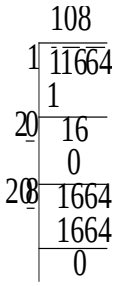
Sol Square root of $\overline{106929}$ will have 3 digits. As 3 is the largest digit whose square is less than 10 (number under left most bar). Here 10 is our dividend and 3 is our divisor and quotient.



$\sqrt{106929} = 327$

Ex.2 Find square root of 11664.

Sol



$\sqrt{11664} = 108$