SQUARES AND SQUARE ROOTS

FINDING SQUARE ROOT THROUGH REPEATED SUBTRACTION

Method of Successive Subtraction for Finding the Square Root

We subtract the numbers, 1, 3, 5, 7, 9, 11, ... successively till we get zero. The number of subtractions will give the square root of the number.

Ex.1 Find the square root of 64 using the method of successive subtraction.

Sol $64 - 1 = 63$; $63 - 3 = 60$; $60 - 5 = 55$; $55 - 7 = 48$; $48 - 9 = 39$;

$39 - 11 = 28$; $28 - 13 = 15$; $15 - 15 = 0$

$\therefore$ The number of subtractions to yield zero is 8.

$\therefore \sqrt{64} = 8$

Prime Factorization Method for Finding the Square Root

Take the number (n) whose square root is required.

(i) Write all the prime factors of n.

(ii) Pair the factors such that primes in each pair thus formed are equal.

(iii) Choose one prime from each pair and multiply all such primes.

(iv) The product of these primes is the square root of n.

Ex.2 Find square root of 7225.

Sol

5	7225
5	1445
17	289
17	17
	1

$7225 = (5 \times 5) \times (17 \times 17)$

$\sqrt{7225} = 5 \times 17 = 85$

Ex.3 Find square root of 4096.

Sol

2	4096
2	2048
2	1024
2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
	2

$4096 = (2 \times 2) \times (2 \times 2) \times (2 \times 2) \times (2 \times 2) \times (2 \times 2) \times (2 \times 2)$

$\sqrt{4096} = 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 64$