Square Roots

A. Square Roots of perfect Squares.

Squaring → Multiplying No. by itself.

Thus $4 \times 4 \Rightarrow$ Square of '4'. (reps. 4^2)

Eg: $4^2 = 4 \times 4 = 16$.

$5^2 = 5 \times 5 = 25$

Hence - '16' is the 'Square of 4'

& '4' is the 'Square root' of 16'

III^{ly} '5' is the 'Square root of 25'

Method :

S1: Memorize the table below:

Number.	Square
1	1
2	4
3	9
4	16
5	25
6	36
7	49
8	64
9	81
10	100.

Observe: Depending on the ending Number the Sq. Root can be arrived.

Eg: If the Number ends with 1 then the
(In Sq. root) → either 1, or 9.

with 4, → 2, 8.
6, → 4, 6 etc.

Hence we arrive at the table:

Last digit of Square	Last digit of Sq. root
1	1 or 9.
4	2 or 8.
9	3 or 7
6	4 or 6.
5	5
0	0

Square → last digit 9 → last digit of Sq. root = 3 or 7.

* perfect Square will never end with 2, 3, 7 or 8

Table for Number & Square:

Number	Square
10	100
20	400
30	900
40	1600
50	2500
60	3600
70	4900
80	6400
90	8100
100	10000

Q. Find the Square root of 7744

* Number ends with '4' → 2 or 8.

Ans. at this stage } 2 or 8

* From Refn. Table.

80 6400 } → 7744 lies between 80 & 90
90 8100

* Step 1 we know Sq. root ends with 2 or 8.
Hence the No. can be 82 or 88.

* Check the Number, whether it is closer to 6400 or 8100.
Here 7744 is close to 8100.
Hence the No. - 88

Q: Find the Square root of 9801

1. Ending - '1' → 1 or 9

2. 90 8100 } → 9801 → 91 or 99
100 10000

3. closer to 10000 → 99

Q. Find the Square root of 5184

1. 4 → 2, 8

2. $70^2 = 4900$ } 5184 → 72 or 78.
$80^2 = 6400$

3. close to 4900 - 72

Q. Find the Square root of 2304

① __2__ , __8__

② $40^2 = 1600$] 2304 - 42 or 48.
$50^2 = 2500$]

③ 2304 close to 2500 - 48.

Q. Find the Square root of 529

① __3__ or __~~7~~__

② $20^2 = 400$.] 529 - 23 or 27.
$30^2 = 900$.]

③ closer to 400 → 23

Q. Find the Square root of 12544

① __2__ or __8__.

② 110 - 12100. ⟩ 112 or 118.
120 - 14400. ⟩

③ 112.

Q. Find the Square root of 25281.

① __1__ or __9__.

② 150 — 22500. ⟩ 151 or 159.
160 — 25600. ⟩

③ 159.

* Comparision with conventional method.

EXERCISE

PART A

Q (1). Find the Square roots of the following Nos.

(1) 9216

(2) 7569

(3) 5329

(4) 3364

(5) 1681

PART B

Q (1). Find the Square roots of the following Nos.

(1) 9801

(2) 5625

(3) 1936

(4) 3481.

(5) 1369.

PART C.

Q (1) Find the Square roots of the following Nos.

(1) 12769

(2) 15625

(3) 23104

(4) 11881.