

Chap 1. A square and A cube.

* Mind map:

Square & Square roots

Square roots ($\sqrt{\quad}$)

Ex: $\sqrt{25} = 5$

Finding Square roots

Ex: $\sqrt{4} = 2$

Pythagorean Triplet

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

Prime factorisation.

Ex: $8 = 2 \times 2 \times 2$

Cubes & Cube roots

Cube root

$$\sqrt[3]{\quad}$$

Ex: $\sqrt[3]{27} = 3$

Prime factorisation

Ex: $\sqrt[3]{27}$

$$\begin{array}{r} 3 \overline{) 27} \\ 3 \overline{) 9} \\ 3 \end{array}$$

Hardy Ramanujan

$$1729 = 12^3 + 1^3 = 10^3 + 9^3$$

* Square Number:

Any natural number multiplied by itself, the resulting number is called square number (or) perfect square.

Example: 1, 4, 9, 16, 25, ...

Properties of square numbers:

- The square of an even number is even.

$$\text{Eg: } 6^2 = 36$$

$$12^2 = 144$$

- The square of an odd number is odd.

$$\text{Eg: } 3^2 = 9$$

$$5^2 = 25$$

- The perfect square numbers never ends with 2, 3, 7, 8

- A natural number can be a perfect square only if its last digit is 0, 1, 4, 5, 6 or 9.

Ex: 10, 221, 24, and 326 are not perfect squares.
100, 121, 144 and 169 are perfect squares.

- The square of a number ending with 1 (or) 9 ends with 1. Ex: $21^2 = 441$; $9^2 = 81$

- The square of a number ending with 2 (or) 8 ends with 4. Ex: $12^2 = 144$; $8^2 = 64$

- The square of a number ending with 3 (or) 7 ends with 9. Ex: $13^2 = 169$; $7^2 = 49$

- The square of a number ending with 4 (or) 6 ends with 6. Ex: $4^2 = 16$; $6^2 = 36$

- The square of a number ending with 5 ends with 5. Ex: $5^2 = 25$

- The square of a number ending with 0 ends with even number of zeros. Ex: $10^2 = 100$

- For any natural number n , we have $n^2 = \text{Sum of first 'n' odd natural numbers}$

$$\text{Ex: } 16 = 4^2 = 1 + 3 + 5 + 7 = 16$$

- Between the squares of any 2 consecutive

natural numbers n and $n+1$, there are ' $2n$ ' non perfect square numbers.

Ex: $4^2 = 16$; $5^2 = 25$

$n = 4 \Rightarrow 2n = 2 \times 4 = 8$

- For any natural number n greater than 1, $(2n, n^2-1, n^2+1)$ is a pythagorean triplet.
- If $m > 1$ and odd, then the pythagorean triplet is $(m, \frac{m^2-1}{2}, \frac{m^2+1}{2})$

* Square root:

The square root of a given natural number n is that ^{natural} number which when multiplied by itself gives n as the product.

we denote the square root of n by $\sqrt{n}$.

Ex: $\sqrt{9} = \sqrt{3 \times 3} = \sqrt{3^2} = 3$

* Cube of a number:

A number is said to be cubed, when it is multiplied by itself 3 times.

Ex: 1, 8, 27, ...

* Properties of cubes of the numbers:

- The cube of an even number is always even
Ex: $2 \times 2 \times 2 = 8$
- The cube of an odd number is always odd.
Ex: $7 \times 7 \times 7 = 343$

If a number ends in	its cube will end in
0, 1, 4, 5, 6, 9	0, 1, 4, 5, 6, 9
2	8
3	7
7	3
8	2

- The square of the sum of the cubes of the first n natural numbers is equal to their total.

$$\text{Ex: } (1+2+3)^2 = 1^3 + 2^3 + 3^3$$

$$(6)^2 = 1 + 8 + 27$$

$$36 = 36$$

- The cube of a negative number is always negative

$$\text{Ex: } (-2) \times (-2) \times (-2) = -8$$

- The cube of a positive number is always positive

$$\text{Ex: } (4) \times (4) \times (4) = 64$$

- Cube root a negative perfect cube is negative

$$\text{Ex: } \sqrt[3]{(-125)}$$

$$\sqrt[3]{125 \times (-1)} = \sqrt[3]{(-1)} \times \sqrt[3]{125}$$

$$= -1 \times 5 = -5$$

PROBLEMS TO BE COMPLETED IN CLASSWORK:

LEARNERS - CLASS ACTIVITY [P.g.NO: 1.13]

$$1.1 - 1, 2$$

$$1.2 - 6, 8$$

PERFORMERS - CLASS ACTIVITY [P.g.NO: 1.14]

$$1.1 - 2$$

$$1.2 - 6, 7, 8$$

PERFORMERS - HOME ACTIVITY

$$1.2 - 6, 8, 10$$

ACHIEVERS - CLASS ACTIVITY [P.g.NO: 1.15]

$$1.1 - 2$$

$$1.2 - 4, 5, 9$$

ACHIEVERS - HOME ACTIVITY [P.g.NO: 1.15]

$$1.1 - 2, 3$$

$$1.2 - 4, 7, 8$$

Learners

[P.g. NO : 1.24, 1.25 & 1.26]

Class Activity - 2.1 - 5

2.2 - 6

Home activity - 2.2 - 7

Performers.

Class Activity - 2.1 - 1, 2

2.2 - 5, 6, 7

Home activity - 2.2 - 3, 6

Achievers.

Class Activity - 2.1 - 3, 4

2.2 - 7.

NCERT FOLDER [P.g. NO: 1.26, 1.27 & 1.28]

Very short answer type questions (2 Marks)

1, 2 - i, 3, 4, 5, 6, 14, 15, 8, 9, 18, 19, 20

Short answer type questions (3 Marks)

1, 2, 3, 4, 5, 6, 7 - ii, 8, 9, 10, 11, 12, 14, 15
16, 17.

Long answer type questions : (5 Marks).

1, 2, 3, 4, 5, 6, 7, 9, 10, 12, 14 - ii, V, 15 - ii

16 - ii, iii.