

Chapter 3 : Square & square roots, cube & cube roots

The square of a number is obtained by multiplying the number itself.

Example

Square of 5 = $5 \times 5 = 25$

For any number n , square of n is $n \times n = n^2$

PROPERTIES OF SQUARE NUMBERS

Following are some properties of square numbers :

1. Square of an even natural number is always an even natural number.

e.g., 4 is even and $4^2 = 16$ is also even

2. Square of an odd natural number is always an odd natural number.

e.g., 7 is odd and $7^2 = 49$ is also odd

3. Square of a number, positive or negative, is always positive

e.g., i) $(-3)^2 = 9$

ii) $5^2 = 25$

4. Square of a proper fraction is always less than the fraction itself.

e.g., $\frac{2}{5}$ is a proper fraction and $(\frac{2}{5})^2 = \frac{4}{25}$

$$\therefore \frac{4}{25} < \frac{2}{5}$$

5. The square of a decimal number greater than 1 is greater than the decimal number itself.

e.g., $(1.2)^2 = 1.2 \times 1.2 = 1.44 > 1.2$

SQUARE ROOT

The square root of a number is that number which when multiplied by itself is equal to the given number.

Square root of a number n is denoted by \sqrt{n} .

Example

$\sqrt{9} = 3$ as $3 \times 3 = 9$

PERFECT SQUARE

Numbers which are square of some number are called perfect square.

Example

$1 = 1^2$, $4 = 2^2$, $9 = 3^2$, $16 = 4^2$ and so on

$\therefore 1, 4, 9, 16, \dots$ are all perfect square .

Note

No perfect square number will end with 2 , 3 , 7 , 8 .

CUBES

The cube of a number is that number raised to the power 3 i.e., cube of $a = a^3$ (read cube of a) .

Clearly, $a^3 = a \times a \times a$

Example

$2^3 = 8$, $3^3 = 27$, etc

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PROPERTIES OF CUBE

i) Cube of an even number is even .

e.g $4^3 = 64$

ii) Cube of an odd number is odd

e.g $5^3 = 125$

iii) Cube of a positive number is positive. .

e.g $3^3 = 27$

iv) Cube of a negative number is negative .

e.g $(-2)^3 = -8$

v) Cubes of the numbers ending in 0, 1 , 4 , 5 , 6 and 9 end in 0, 1 , 4 , 5 , 6 and 9 respectively .

$(10)^3 = 1000$

$$(11)^3=1331$$

$$(14)^3 = 2744$$

$$(16)^3=4096$$

$$(25)^3=15625$$

$$(29)^3 =24389$$

PERFECT CUBE

A number is said to be a perfect cube, if it is the cube of some number .

e.g 343 is a perfect cube as $343 = 7 \times 7 \times 7 = 7^3$

CUBE ROOT

The Cube root of a given number is that number which when raised to the power three gives the given number .

The symbol used for cube root is $\sqrt[3]{b}$.

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