CALCULATION-05

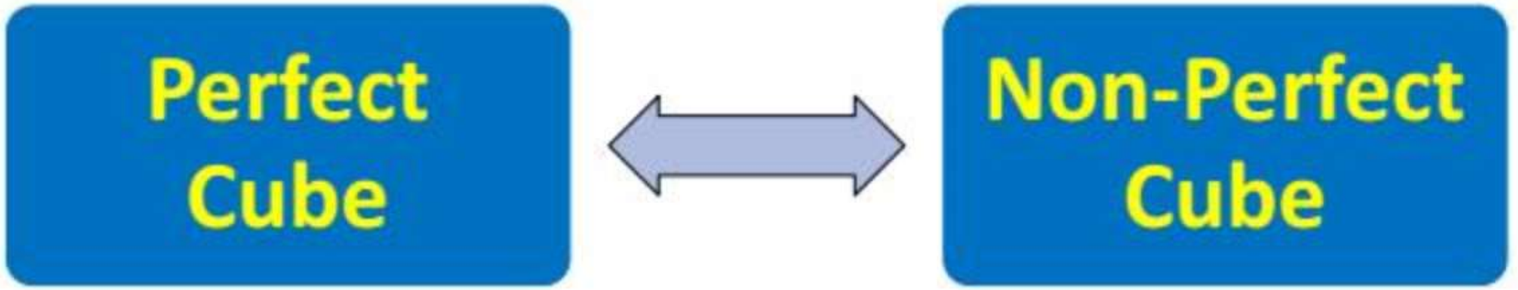
CUBE ROOT

(घन मूल)

CLASS NOTES

BY ADITYA RANJAN

Square Root / घनमूल



Cube Root of perfect square
पूर्ण घन का घनमूल

A perfect cube is a number that is the cube of an integer.

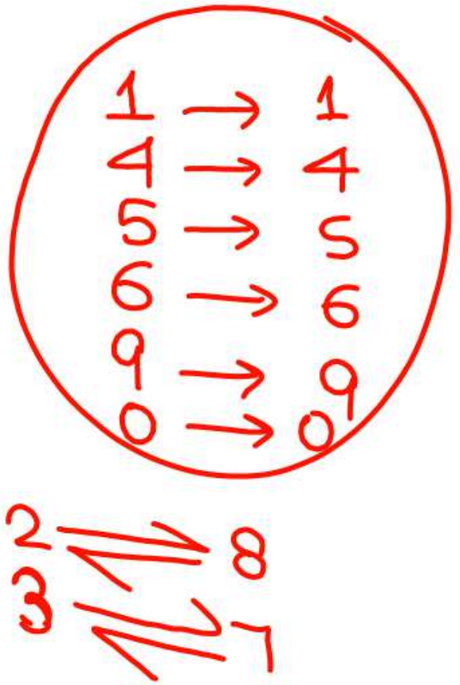
पूर्ण घन वह संख्या होती है जो पूर्णांक का घन होती है।

For example,

64, 216, 1728, 2744, etc

4x4x4

1^3	1
2^3	8
3^3	27
4^3	64
5^3	125
6^3	216
7^3	343
8^3	512
9^3	729
10^3	1000



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Example: Calculate the cube root of 157464

First make a group of 3-digits starting from the unit digit.

$\overline{157}\ \overline{464}$

Unit digit of 157464 is 4. 5 4 ✓

So the unit digit of cube root will be 4.

Now, calculate the tens digit of cube root of 157464, we should find a natural number whose cube root is just less than 157

In this case, it is 5.

Cube root of 157464 is 54.

Find the cube root of

$\sqrt[3]{21952} =$

28

Find the cube root of

(21952) =

$\overline{(148877)}$ = 5 3

$\overline{(300763)}$ = 6 7

$\overline{(91125)}$ = 4 5

Find the cube root of

$\overline{24389}$ = 29

$\overline{39304}$ = 34 ✓

$\overline{636056}$ = 86

$\overline{753571}$ = 91 ✓

Find the cube root of

$438976 =$

$35937 =$

$438976 =$

$830584 =$

If the number is greater than 10 lakhs but less than 100 crores

यदि संख्या 10 लाख से अधिक लेकिन 100 करोड़ से कम है

$$\sqrt[3]{34965783} =$$

$\overline{034}\,\overline{965}\,\overline{783}$ = 3 x 7

-343

④

Step1: 327 ans

Step2:

$3(^2)x \rightarrow 4$

$3 \times 9 \times x \rightarrow 4$

$7 \times x \rightarrow 4$

↓

2

$$\sqrt[3]{702595369} =$$

$\overline{702}\,\overline{595}\,\overline{369} = 8 \times 9$

-729

(4)

889

S-1

S-2

$3 \times 1^2 \times x \rightarrow 4$

$3 \times 1 \times x \rightarrow 4$

$3 \times x \rightarrow 4$

8

$$\sqrt[3]{33076161} =$$

$\overline{033}\,\overline{076}\,\overline{161}$ = 3 x 1

S-1

$$\begin{array}{r} -1 \\ \hline 60 \end{array}$$

321

S-2

$3(^2 \times x \rightarrow 6$

$3 \times 1 \times x \rightarrow 6$

$\downarrow$

2

$$\sqrt[3]{893056347}$$

$\overline{893}\,\overline{056}\,\overline{347} = \underline{9}\ \ \underline{x}\ \ \underline{3}$

$$\begin{array}{r} -\,27 \\ \hline 20 \end{array}$$

S-1

$3 \times 9^2 \times x \to 2$

$3 \times 9 \times x \to 2$

$7 \times x \to 2$

$\downarrow$

6

$\therefore$ 963

$$\sqrt[3]{106496424} =$$

D.S = 9

106496424 = 4 x 4

424 = $(1)^3$ = 1 X

444 $(6)^3$ ✓

216

9

S-1

- 64

60

S-2

$3 \times 1^2 \times x \rightarrow 6$

$3 \times 6 \times x \rightarrow 6$

$8 \times x \rightarrow 6$

24

$$\sqrt[3]{485587656} =$$

$= 9$

$485587656 = 7 \times 6$

-216

40

736 $= (7)^3 = 343$

$= 1$

786

$\hookrightarrow (3)^3 = 27 = 9$

$3x(^2)xx \rightarrow 4$

$3x6xx \rightarrow 4$

$8xx \rightarrow 4$

Ans

$$\sqrt[3]{169112377} =$$

Ans in comment Box

Square Root of Non-perfect square
अपूर्ण वर्ग का वर्गमूल

$$\sqrt[3]{N} = A \pm \frac{B}{3.A^2}$$

First find a number which is a perfect cube near to the number N, let it be a and the difference between N and a^3 is b.

Note:

+ sign is used if $N > a^3$

– sign is used if $N < a^3$

$\sqrt[3]{72}$ → (4)

-64

$A \pm \frac{B}{3A^2}$

$4 + \frac{8}{3 \times 16^{2}}$

$= 4 + \frac{1}{6}$

$= 4.16$

$\sqrt[3]{10} =$

$\frac{8}{2}$

$A \pm \frac{B}{3A^2}$

$2 + \frac{2}{3 \times 4^2}$

$= 2 + \frac{1}{6}$

$= 2.16$

Ex. $\sqrt[3]{60}$ =

$\frac{-64}{-4}$

$A \pm \frac{B}{3A^2}$

$= 4 - \frac{4}{3 \times 16} 1$

$= 4 - \frac{1}{12}$

$= \frac{47}{12}$

$= 3.9$

Ex. $\sqrt[3]{118}$ =

125

-7

$A \pm \frac{B}{3A^2}$

$5 - \frac{7}{3 \times 25}$

$= 5 - \frac{7}{75}$

$= \frac{368}{75} =$ —

Ex. $\sqrt[3]{226}$ =

$\sqrt[3]{953}$

-1000

-47

$a \pm \frac{b}{3a^2}$

$10 - \frac{47}{3 \times 100}$

$= 10 - \frac{16}{100}$

$= 10 - 0.16$

$= 9.84$

Ex. $\sqrt[3]{525}$ =

Ex. $\sqrt[3]{706}$ =

Ex. $\sqrt[3]{953}$ =

Ex. $\sqrt[3]{1365}$ =

Ex. $\sqrt[3]{1500}$ =

Ex. $\sqrt[3]{255}$ =

$$3\overline{)1365}$$

$$-1331$$

$$34$$

$$A \pm \frac{B}{3A^2}$$

$$11 + \frac{34}{3 \times 11^2}$$

$$= 11 + \frac{34}{3 \times 3}$$

$$= 11 + 0.1$$

$$= 11.1$$