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CUBES AND CUBE ROOTS

The word 'cube' is used in geometry. A cube is a solid figure which has all it's sides equal.

Consider the numbers 1, 8, 27, ...

These are called perfect cubes or cube numbers.

Can you say why they are named so?

Each of them is obtained when a number is multiplied by taking it three times.

Perfect cubes:

The Perfect Cubes are the cubes of the whole numbers

Points to remember:

1^3	1	Cube of 1 ends with 1
2^3	8	Cube of 2 ends with 8
3^3	27	Cube of 3 ends with 7
4^3	64	Cube of 4 ends with 4
5^3	125	Cube of 5 ends with 5
6^3	216	Cube of 6 ends with 6
7^3	343	Cube of 7 ends with 3
8^3	512	Cube of 8 ends with 2
9^3	729	Cube of 9 ends with 9
10^3	1000	Cube of 10 ends with 0

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Find out the cube root of 19683.

Step 1: underline the last three digits and see it is ending with 3 that means

Explanation: Look at the table; we can see that cube of 7 ends with 3, so the unit digit of the required number would be 7

Step 2: Now look in the table and find the greatest cube which is less than 19. We can see in this case it is 8 and its cube root is 2.

So the digit at tens place would be 2

Therefore the cube root of 19683 is 27.

What is the cube root of 250047?

A. 52
B. 63
C. 74
D. 23

Answer: B

Step 1: 250<u>047</u>

Last three digit ending with 7 , From the table a cube of 3 is ending with 7 is ,it means the unit digit would be 3 .

Step 2: Now see the first three digits .From the table we can see that the largest cube which is less than 250 is 216(63). So the digit at tens place would be 6

Therefore the cube root of 250047 is 63.

What is the cube root of 175616?

A. 42
B. 36
C. 56
D. 86

Answer: C

Ending with 6 and from the table we know that cube of 6 ends with 6
largest cube which is less than 175 is 125 and it is the cube of 5 so the tens digit would be 5.

There the cube root of 175616 is 56.

By what least number 4320 be multiplied to obtain a number which is a perfect cube?

A. 45
B. 48
C. 52
D. 50

Answer: D

Clearly, 4320 = 23 * 33 * 22 * 5.

To make it a perfect cube, it must be multiplied by 2 * 5^2 i.e,50.

Find the least number by which 750 should be multiplied, so that it becomes a perfect cube.

A. 12
B. 24
C. 36
D. 48

Answer: C

Prime factorization of 750= (2 * 3 * 5 * 5 * 5)

To make it perfect cube we should multiply with (2 * 2) * (3 * 3) = 36.

Find the cube root of 2744

    A.   12
    B.   14
    C.   13
    D.   16

.

Answer: B

Resolve the given number as the product of prime factors and take the product of prime factors, choosing one out of three of the same prime factors. Resolving 2744 as the product of prime factors, we get: 2744 =2^3.7^3.

√(3&2744) = 2 x 7 = 14.

Find the cube and cube root of 27?

A. 19683, 3
B. 19723, 3
C. 18720, 4
D. 18683, 3

Answer: A

The cube of 27 will be found by multiplying it three times i.e. 27 * 27 * 27 = 19683.

Now the prime factorization of 27 is 3 * 3 * 3. As you know, you need to take one number for every group of three. As 3 appear three times, taking a single 3 for the same, the cube root of 27 is 3.

The cube root of 74088 is

    A.   47
    B.   42
    C.   37
    D.   52

Answer: B

$74088 = 6 \times 6 \times 6 \times 7 \times 7 \times 7 = 6^3 \times 7^3$

Then the cube root of $74088 = 74088^{(1/3)} = (6^3 \times 7^3)^{1/3}$

$6 \times 7 = 42$

Hence the answer is 42.

Find the least number which is used to multiply $(4^2 \times 3^3 \times 6)$ to get a perfect cube

A. 120
B. 144
C. 169
D. 216

Answer: B

Given number is 4^2 x 3^3 x 6

i.e., 4 x 4 x 3 x 3 x 3 x 6

If we multiply the above by 4 x 6 x 6 then we have the nearest cube (4^3 x 3^3 x 6^3) of the given number.

Hence, the answer is 4 x 6 x 6 = 144.

Find the least number that is multiplied by 3969 to get a number which is a perfect cube:

A. 65
B. 72
C. 63
D. 78

Answer: C

Resolving the given 3969 as a product of prime factors as

$3969 = 7 \times 7 \times 9 \times 9 = 7^2 \times 9^2$

To make a number perfect cube, we have to multiply that number by the least number (7 x 9).

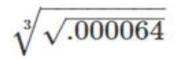$(7 \times 9) \times 7^2 \times 9^2 = 3969 \times (7 \times 9)$

$7^3 \times 93 = 3969 \times 63$

Hence, the answer is 63

Evaluate

$$\sqrt[3]{\sqrt{.000064}}$$

A. 0.0002
B. 0.002
C. 0.02
D. 0.2

Answer: D

√.000064

=√(64/10^6)

=8/10^3

=.008

=√(3&.008)

=√(3&8/1000)

=2/10

=0.2

The largest four digit number which is a perfect cube, is:

A. 7000
B. 8000
C. 9261
D. 9999

Answer: C

21*21*21 = 9261

Find out the cube root of 1728

    A.   12
    B.   16
    C.   13
    D.   23

Answer: A

First we will do prime factorization.

Prime factorization of 1728 is = 2 * 2 * 2 * 2 * 2 * 2 * 3* 3 * 3

= (2 * 2 * 3) * (2 * 2 * 3) * (2 * 2 * 3).

= 12 * 12 * 12 the cube root of 1728 is 12.

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Find the cube root of 15625

A. 19
B. 23
C. 25
D. 21

Answer: C

Sol: The factors of 15625 are = 5 * 5 * 5 * 5 * 5 * 5.

= (5 * 5) * (5 * 5) * (5 * 5)

=25 * 25 * 25 Þ the cube root of 15625 is 25.

Find the smallest number by which 73002 should be divided so as to make it a perfect cube.

A. 12
B. 6
C. 7
D. 11

Answer: B

●Sol: The prime factorization of the number 73002 is <u>23 * 23 * 23</u> * 2 * 3.

●As you can see 23 already appears three times, there is a single 2 and a single 3.

●This implies if this number is divided by 6, it will become a perfect cube.

●Hence the answer to the question will be 6.

The cube root of .000216 is

A. .6
B. .06
C. .007
D. .87

Answer: B

$(.000216)^{1/3} = 216 1/3 10^{6}$

$= 6/10^{2}$

$= 6/100$

$= 0.06$

THANK YOU