CUBE ROOT (PRIME FACTORIZATION)

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Introduction to Cube root

In Math, there is always an "opposite" operation! The opposite operation for "cubing" a number is taking the "cube root".

Cube root is the opposite of cubing a number.

Term for raising a number to the 3rd power is "cubing a number".

For example:
23 = 8 this can be read as 2 "cubed" equals 8.

This means that 2 x 2 x 2 = 8.

We represent cube root using this symbol ‘ ’

And to show that cube root is opposite of cubing a number, let have a look at the following example:

23 = 8 and 8 = 2 x 2 x 2 = 2

Finding Cube Root by Prime Factorization

To find the cube root of a number by prime factorization, we follow the following steps:

Step I: Find the prime factors of the given number.

Step II: Make groups of 3 same factors.

Step III: Take one prime factor from each group of prime factors of the given number.

Step IV: Find the product of these prime factors to get the cube root of the given number.

Let’s understand this with example:

Find the cube root of 3375 by prime factorization.
Step I: Find the prime factors of the given number.
3375 = 3 x 3 x 3 x 5 x 5 x 5

Step II: Make groups of 3 same factors.
(3 x 3 x 3)
(5 x 5 x 5)

Step III: Take one prime factor from each group of prime factors of the given number.
(3 x 3 x 3) – 3
(5 x 5 x 5) – 5

Step IV: Find the product of these prime factors to get the cube root of the given number.
3 x 5 = 15

Hence the cube root of 3375 is 15.

Let's try more examples to understand the concept better:

Find cube root of 5832 by prime factorization.

Step I: Find the prime factors of 5832
5832 = 2 x 2 x 2 x 3 x 3 x 3 x 3 x 3 x 3

Step II: Make groups of three same factors
2 x 2 x 2
3 x 3 x 3
3 x 3 x 3

Step III: Take one prime factor from each group of prime factors of 5832
2 x 2 x 2 - 2
3 x 3 x 3 - 3
3 x 3 x 3 – 3

Step IV: Find the product of these prime factors to get the cube root of the given number.
2 x 3 x 3 = 18

So, Cube root of 5832 is 18.

Now try it yourself! Should you still need any help,click here to schedule live online session with e Tutor!

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Reference Links:

- http://en.wikipedia.org/wiki/Cube_root
- http://www.khanacademy.org/video/prime-factorization?playlist=Developmental%20Math
- http://en.wikipedia.org/wiki/Prime_factor

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