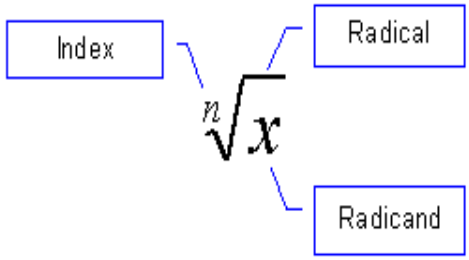
Perfect Roots

Roots are the inverse of exponents. An *n*th root "undoes" raising a number to the *n*th power, and vice-versa.

For example, the number four with an exponent of three, $4^3 = (4 \times 4 \times 4) = 64$

Inversely, when you take the third (cube) root of 64, the result is 4.

In general, the *n*th root of a number is written:



$\sqrt[n]{x} = y$ if and only if $y^n = x$ therefore $\sqrt[3]{64} = 4$ because $4^3 = 64$

We leave the index off the square root symbol only because it is the most common one. It is understood that if no index is shown, then the index is 2.

Square Root of	Cube Root of	Fourth Root of	Fifth Root of	Is
1	1	1	1	**1**
4	8	16	32	**2**
9	27	81	243	**3**
16	64	256	1,024	**4**
25	125	625	3,125	**5**
36	216	1,296	7,776	**6**
49	343	2,401	16,807	**7**
64	512	4,096	32,768	**8**
81	729	6,561	59,049	**9**
100	1,000	10,000	100,000	**10**
121	1,331	14,641	161,051	**11**
144	1,728	20,736	248,832	**12**