Section 7.1: n^{th} roots (Radicals)

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10:03 AM

n^{th} root:

$5^2 = 25$ and $(-5)^2 = 25$

we say that 5 and -5 are square roots of 25

(5, the positive one, is called the principal square root)

so, if $a = b^n$ for positive integer n, then b is an n^{th} root of a

- if $a = b^2$, b is a square root of a
- if $a = b^3$, b is a cube root of a

if n is a positive even integer and the variable a is also positive, then there are two real n^{th} roots of a:

5 and -5 are square roots of 25

2 and -2 are fourth roots of 16

and the positive one is called the principal square root

note: if a is negative with n even, then the n^{th} root of a is not a real number

$\sqrt{-25}$ ← not a real number

if n is an odd positive integer, then there is only one real n^{th} root of a, provided that a is real

$\sqrt[3]{8} = 2$

$\sqrt[3]{-8} = -2$

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the radical symbol

$\sqrt[n]{a}$

↑

n is the index