



Lesson 5.3: Evaluating n^{th} Roots (a review)

Definition: n^{th} root

For any real numbers a and b , and any positive integer n , if $a^n = b$, then a is the n^{th} **root** of b .

A **radical sign** is used to indicate a root. The number under the radical sign is the **radicand**. The **index** gives the degree of the root.

$$\begin{array}{c} \text{index} \\ n \\ \sqrt{} \\ \text{radicand} \\ a \end{array} \begin{array}{c} \text{radical} \\ \text{sign} \end{array}$$

Rational Exponents vs. Radical Notation



Radical Form	Rational Exponent Form
$\sqrt[5]{7}$	
$\sqrt[9]{y^2}$	
$\sqrt[3]{9}$	
	$6^{1/8}$
	$\left(\frac{2}{3}\right)^{5/6}$



Evaluate the following radical or rational exponent expressions.

a) $\sqrt[3]{-8}$

e) $(-27)^{1/3}$

b) $16^{3/2}$

f) $\sqrt{49}$

c) $\sqrt[4]{16}$

g) $(81)^{-1/4}$

d) $\sqrt{-100}$

h) $(32)^{-3/5}$

Examples)

a) $5^{1/2} \cdot 5^{3/2} =$

d) $36^{-1/2} =$

b) $\left(\frac{3}{3^2}\right)^4$

e) $\frac{4^{5/2}}{4^{1/2}} =$

c) $(16 \cdot 9)^{1/2} =$

f) $\left(\frac{27}{64}\right)^{1/3} =$