

$$a^{1/n} = \sqrt[n]{a}; \quad 0^{1/n} = 0$$

$$a^{m/n} = \begin{cases} (a^{1/n})^m = (\sqrt[n]{a})^m \\ (a^m)^{1/n} = \sqrt[n]{a^m} \end{cases}$$

$$a^{-m/n} = \frac{1}{a^{m/n}} = \frac{1}{(\sqrt[n]{a})^m}$$

Strategy for Evaluating $a^{-m/n}$

1. Find the n^{th} root of a .
2. Raise the result to the m^{th} power.
3. Find the reciprocal.

Rules for Rational Exponents

1. Product Rule: $a^r a^s = a^{r+s}$
2. Quotient Rule: $\frac{a^r}{a^s} = a^{r-s}$
3. Power of a Power Rule: $(a^r)^s = a^{rs}$
4. Power of a Product Rule: $(ab)^r = a^r b^r$
5. Power of a Quotient Rule: $\left(\frac{a}{b}\right)^r = \frac{a^r}{b^r}$

Square Root of x^2

$$(x^2)^{1/2} = |x|$$

$$\sqrt{x^2} = |x|$$