Radical Rules

$\sqrt[m]{a^m} = |a|$ $\quad m = \text{odd } \#$

Root and exponent cancel eachother out

$\sqrt[\blacksquare]{\blacksquare^{\blacksquare}} = |\blacksquare|$

$\sqrt[m]{a^m} = a$ $\quad m = \text{even } \#$

Root and exponent cancel eachother out

$\sqrt[\blacksquare]{\blacksquare^{\blacksquare}} = \blacksquare$

Ex) $\sqrt{3} \times \sqrt{x} = \sqrt{3x}$

$\sqrt[m]{a} \times \sqrt[m]{b} = \sqrt[m]{a \times b}$

when roots match put them under one root

$\sqrt[\blacksquare]{\blacksquare} \times \sqrt[\blacksquare]{\blacksquare} = \sqrt[\blacksquare]{\blacksquare \times \blacksquare}$

$\sqrt[m]{\frac{a}{b}} = \frac{\sqrt[m]{a}}{\sqrt[m]{b}}$

Ex) $\sqrt[3]{\frac{2}{y}} = \frac{\sqrt[3]{2}}{\sqrt[3]{y}}$

break it - root neumerator

root denominator

$\sqrt[\blacksquare]{\frac{\blacksquare}{\blacksquare}} = \frac{\sqrt[\blacksquare]{\blacksquare}}{\sqrt[\blacksquare]{\blacksquare}}$

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

Ex) $\sqrt[3]{x^2} = (\sqrt[3]{x})^2 = x^{2/3}$

root and inside exponent
root becomes 1/index, exponent becomes neumerator.

$$\sqrt[\square]{\square^{\square}} = (\sqrt[\square]{\square})^{\square} = \square^{\square/\square}$$

Rational Properties

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

Ex) $x^{-2/3} = \frac{1}{x^{2/3}}$

Cannot have negative exponents

$$\square^{(\frac{-\square}{\square})} = \frac{1}{\square^{\square/\square}}$$

$$\frac{1}{a^{-m}} = a^m$$

Ex) $\frac{1}{2^{-x}} = 2^x$

Cannot have negative exponents

$$\frac{1}{\square^{-\square}} = \square^{\square}$$