

# RATIONAL EXPONENTS!

Radical Form		Rational Exponent Form
$\otimes$ $\sqrt{x^3}$	$\longleftrightarrow$	$\otimes$ $x^{\frac{3}{2}}$
$\otimes$ $\sqrt[5]{x^2 y^3}$	$\longleftrightarrow$	$\otimes$ $x^{\frac{2}{5}} y^{\frac{3}{5}}$
$\otimes$ $\sqrt[6]{x^1}$	$\longleftrightarrow$	$\otimes$ $x^{\frac{1}{6}}$

**RADICAL** Form to **RATIONAL EXPONENT** Form Rule

$a\sqrt{x^b} = x^{\frac{b}{a}}$

power  $\leftarrow$   $\frac{b}{a}$   
 root  $\leftarrow$   $a$

Evaluate

$81^{-\frac{1}{4}} = \frac{1}{81^{\frac{1}{4}}} = \frac{1}{a^{\frac{1}{4}}(a^{\frac{1}{4}})} = a^{-\frac{1}{4}}$  (Note:  $\frac{1}{3}$  in cloud)

$b^{-\frac{5}{6}} = \frac{1}{b^{\frac{5}{6}}} = \frac{1}{b^{\frac{1}{6}} \cdot b^{\frac{4}{6}}} = \frac{1}{b^{\frac{1}{6}} \cdot b^{\frac{2}{3}}}$  (Note:  $\frac{b}{b}$  in cloud)

Rationalize the denominator

$\frac{\sqrt[4]{27}}{\sqrt{3}} = \frac{3^{\frac{3}{4}}}{3^{\frac{1}{2}}} = 3^{\frac{3}{4} - \frac{1}{2}} = 3^{\frac{1}{4}}$  (Note:  $\sqrt[4]{3}$  in cloud)

$\frac{(x^{\frac{1}{2}} - 2)(3x^{\frac{1}{2}} - 2)}{(3x^{\frac{1}{2}} + 2)(3x^{\frac{1}{2}} - 2)} = \frac{3x - 8x^{\frac{1}{2}} + 4}{9x - 4}$  (Note:  $3x - 8x^{\frac{1}{2}} + 4$  and  $9x - 4$  in cloud)

If it starts in radical form, end in rational form!!

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Radical Form		Rational Exponent Form
$\sqrt{x^3}$	$\longleftrightarrow$	
$\sqrt[6]{x}$	$\longleftrightarrow$	$x^{\frac{2}{5}}y^{\frac{3}{5}}$

**! RADICAL Form to RATIONAL EXPONENT Form Rule**

$$a\sqrt{x^b} =$$

**Evaluate**

$81^{-\frac{1}{4}}$        $a^{\frac{2}{7}}(a^{\frac{4}{7}})$        $b^{-\frac{5}{6}}$

**Rationalize the denominator**

$\frac{\sqrt[4]{27}}{\sqrt{3}}$        $\frac{x^{\frac{1}{2}} - 2}{3x^{\frac{1}{2}} + 2}$