

1/14/12 Rational Exponents Part 1

Recall: $5^2 = 5 \cdot 5$ $5^3 = 5 \cdot 5 \cdot 5$ also: $5^{-4} = \frac{1}{5^4}$ *oh crying baby!*

lastly $\sqrt[4]{16} = 2$ "what times what times what times what gives you 16?"

Rules for when exponents are fractions.

The Denominator goes in front of the Radical.

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

you can put the numerator inside the radical or outside, whichever is more convenient

Ex ① *Simplify* $27^{1/3}$ $\sqrt[3]{27}$ $\boxed{3}$

② $32^{-1/5}$ $\frac{1}{32^{1/5}}$ $\frac{1}{\sqrt[5]{32}} = \boxed{\frac{1}{2}}$

③ $27^{2/3}$ $\sqrt[3]{27^2}$ $(\sqrt[3]{27})^2$ $(3)^2 = \boxed{9}$

④ $-9^{3/2}$ $-\sqrt[2]{9^3}$ $-(\sqrt{9})^3$ $-(3)^3$ $\boxed{-27}$

Careful!!! Exponents have really bad eyes. They don't even know the negative is there!

Ex ⑤ $(27^4)^{-1/2}$ $27^{-4/2}$ $27^{-1/3}$ $\frac{1}{27^{1/3}}$

$\rightarrow \sqrt[3]{\frac{1}{27}}$ $\boxed{\frac{1}{3}}$