Section 6-6 RATIONAL EXPONENTS

$$b^{\frac{1}{n}} = \sqrt[n]{b} \qquad b < 0 \text{ and } n \text{ positive integer}$$

Radical form: $\sqrt[3]{27}$

Exponential form
or Rational Exponent form: $27^{\frac{1}{3}}$

Write in radical form: $a^{\frac{1}{5}}$

Write in exponential form: $\sqrt[3]{c}$

Evaluate

$$8^{\frac{1}{3}} = \sqrt{}$$

Evaluate

$$\left(\frac{8}{125}\right)^{\frac{1}{3}} = \sqrt{}$$

Evaluate

Evaluate Expressions with Rational Exponents

$8^{\frac{1}{3}}$

$\left(2^3\right)^{\frac{1}{3}}$

2

$16^{-\frac{1}{4}}$

$\frac{1}{16^{\frac{1}{4}}}$

$\frac{1}{\left(2^4\right)^{\frac{1}{4}}}$

2

$$b^{\frac{m}{n}} = \sqrt[n]{b^m} = (\sqrt[n]{b})^m$$

nonzero real b, integers m,n

$$8^{\frac{2}{3}} = \left(8^2\right)^{\frac{1}{3}} \text{ or } \sqrt[3]{8^2} \text{ or } \left(\sqrt[3]{8}\right)^2$$

$$32^{\frac{2}{5}} = (\sqrt[5]{32})^2 =$$

Simplify means:

Use rational exponents

Positive exponents only

Any exponents in denominator must be POSITIVE INTEGERS

(rationalize if necessary)

$$y^{\frac{1}{7}} \cdot y^{\frac{4}{7}} \rightarrow y^{\frac{1+4}{7}} \rightarrow \boxed{y^{\frac{5}{7}}}$$

Use exponent rules!!!

Use rational expression rules!!

hint: the rule is to subtract exponents

$$\frac{x^{\frac{5}{6}}}{x^{\frac{1}{6}}} \rightarrow$$

$\sqrt[4]{144x^6}$

$$\frac{\sqrt[4]{32}}{\sqrt[3]{2}}$$

hint: different index -rewrite with rational exponents

$$(a^{\frac{2}{3}})^{\frac{6}{5}} \bullet (a^{\frac{2}{5}})^{3}$$

$\sqrt[3]{25} \cdot \sqrt{125}$

$$\frac{144^{-\frac{1}{2}}}{27^{-\frac{1}{3}}}$$

$$\frac{\sqrt[6]{16}}{\sqrt[3]{2}}$$

$$\frac{y^{\frac{1}{2}}+1}{y^{\frac{1}{2}}-1}$$