Rewrite using rational exponent notation

Warm Up.

1.) $(\sqrt[4]{212})^7$ $212^{\frac{7}{4}}$

Rewrite using radical notation

2.) $29^{\frac{5}{9}}$ $(\sqrt[9]{29})^5$

Evaluate without a calculator

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

4.) $256^{\frac{3}{4}}$ $(\sqrt[4]{256})^3 = 4^3 = \boxed{64}$

5.) $343^{-\frac{2}{3}}$ $\frac{1}{(\sqrt[3]{343})^2} = \frac{1}{7^2} = \boxed{\frac{1}{49}}$

6.) $128^{-\frac{5}{7}}$ $\frac{1}{(\sqrt[7]{128})^5} = \frac{1}{2^5} = \boxed{\frac{1}{32}}$

Jan 14-7:58 AM

What are perfect roots? NoCalc

BUILD A PERFECT ROOT CHART

We'll see these numbers over and over and over again.
You'll just need to memorize them.

Let's play with the chart we just built... roots roots roots

n^{th} root - means any next root we consider

Jan 6-8:27 AM

6.1 Rational Exponents continued...

HOW MANY SOLUTIONS WILL WE HAVE...

square root of a negative number?

even root of a negative number?

odd root of a negative number?

Can't $(-4)^{\frac{1}{2}} = \boxed{NP}$

Can $-4^{\frac{1}{2}} = \boxed{-2}$

$\sqrt[3]{-4} = np$

P
E $\rightarrow \frac{1}{2}$
M negative
D
A
S

Jan 10-2:21 PM

Remembering fractions... Adding Subtracting Fractions

Common Denominator to add/subtract

1. $\left(-\frac{1}{3}\right) + \frac{3}{8}$

$\frac{8}{8}\left(-\frac{1}{3}\right) + \frac{3}{8}\cdot\frac{3}{3}$

$\frac{-8}{24} + \frac{9}{24} = \boxed{\frac{1}{24}}$

2. $\left(-\frac{4}{3}\right) - \left(-\frac{3}{2}\right)$

$\frac{2}{2}\left(-\frac{4}{3}\right) - \left(-\frac{3}{2}\right)\frac{3}{3} =$

$\frac{-8}{6} + \frac{9}{6} = \boxed{\frac{1}{6}}$

3. $2 - \frac{13}{8}$

$\frac{8}{8}2 - \frac{13}{8}$

$\frac{16}{8} - \frac{13}{8} = \boxed{\frac{3}{8}}$

Jan 14-7:23 AM

Multiplying Fractions

Straight across top
" " bottom

1. $\frac{8}{7}\cdot\frac{7}{10} = \frac{56}{70} = \frac{8}{10} = \boxed{\frac{4}{5}}$

2. $-\frac{2}{3}\cdot\frac{5}{4} = \frac{-10}{12} = \boxed{\frac{-5}{6}}$

3. $-\frac{5}{4}\cdot\frac{1}{3}$ $\boxed{\frac{-5}{12}}$

4. $-2\cdot\frac{3}{7} = \boxed{\frac{-6}{7}}$

★Dont cross multiply

Jan 14-8:19 AM

Our job is to simplify - that means manipulate the expression till you get to its simplest form.

Your book is the enemy...the answers in the back of the book will not look like yours and that's ok...

Jan 8-6:35 PM

Same exponents rules new format...

KEY CONCEPT *For Your Notebook*

6.2 Apply Properties of Rational Exponents

Property	Example
1. $a^m \cdot a^n = a^{m+n}$	$5^{1/2} \cdot 5^{3/2} = 5^{(1/2+3/2)} = 5^2 = 25$
2. $(a^m)^n = a^{mn}$	$(3^{5/2})^2 = 3^{(5/2 \cdot 2)} = 3^5 = 243$
3. $(ab)^m = a^m b^m$	$(16 \cdot 9)^{1/2} = 16^{1/2} \cdot 9^{1/2} = 4 \cdot 3 = 12$
4. $a^{-m} = \frac{1}{a^m}, a \neq 0$	$36^{-1/2} = \frac{1}{36^{1/2}} = \frac{1}{6}$
5. $\frac{a^m}{a^n} = a^{m-n}, a \neq 0$	$\frac{4^{5/2}}{4^{1/2}} = 4^{(5/2-1/2)} = 4^2 = 16$
6. $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}, b \neq 0$	$\left(\frac{27}{64}\right)^{1/3} = \frac{27^{1/3}}{64^{1/3}} = \frac{3}{4}$

Jan 20-8:23 PM

Properties of Exponents

They are the same properties...just a new situation.
Could be numbers - could be variables

ex 1. $8^{1/2}8^{1/3}$

$8^{\frac{1}{2}+\frac{1}{3}}$

$8^{\frac{3}{3}\cdot\frac{1}{2}+\frac{1}{3}\cdot\frac{2}{2}}$

$8^{\frac{3}{6}+\frac{2}{6}} = \boxed{8^{\frac{5}{6}}}$

ex 3. $(9^{1/3})^{2/3}$

$9^{\frac{1}{3}\cdot\frac{2}{3}} = \boxed{9^{\frac{2}{9}}}$

ex 2. $\frac{4^{1/2}}{4^{2/5}}$

$4^{\frac{5}{5}\cdot\frac{1}{2}-\frac{2}{5}\cdot\frac{2}{2}}$

$4^{\frac{5}{10}-\frac{4}{10}} = \boxed{4^{\frac{1}{10}}}$

ex 4. $(8^{-2/3})(8^{3/4})$

$8^{\frac{4}{4}\cdot-\frac{2}{3}+\frac{3}{3}\cdot\frac{3}{4}}=$

$8^{-\frac{8}{12}+\frac{9}{12}}=$

$\boxed{8^{\frac{1}{12}}}$

Mar 17-10:41 AM

assume 1

Ex 5 $\frac{9}{9^{1/2}}$

$\frac{9^1}{9^{\frac{1}{2}}}$

$9^{1-\frac{1}{2}}=$

$9^{\frac{2}{2}-\frac{1}{2}}=9^{\frac{1}{2}}$

$\sqrt{x}=x^{\frac{1}{2}}$ $=\boxed{3}$

Ex 6 $\frac{x^{3/4}}{x}$

$\frac{x^{\frac{3}{4}}}{x^1}=$

$x^{\frac{3}{4}-\frac{4}{4}}=x^{-\frac{1}{4}}$

$=\boxed{\frac{1}{x^{\frac{1}{4}}}}$

Jan 6-10:18 PM

Properties of Radicals

KEY CONCEPT *For Your Notebook*

Properties of Radicals

Product property of radicals: $\sqrt[n]{a \cdot b} = \sqrt[n]{a} \cdot \sqrt[n]{b}$

Quotient property of radicals: $\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}, b \neq 0$

1. $\sqrt{20}=\sqrt{4}\sqrt{5}$ $=\boxed{2\sqrt{5}}$

2. $\sqrt[3]{16}=\sqrt[3]{8}\sqrt[3]{2}$ $\boxed{2\sqrt[3]{2}}$

looking for a factor of 16 that is a perfect 3rd root

3. $\sqrt[3]{250}=$ $\sqrt[3]{125}\sqrt[3]{2}$ $\boxed{5\sqrt[3]{2}}$

Jan 6-10:32 AM

Simplifying/Pulling out of a radical

1. $\sqrt{8}$ $\sqrt{4}\sqrt{2}$ $\boxed{2\sqrt{2}}$

2. $\sqrt[2]{x^2} = \boxed{x}$

3. $\sqrt[3]{x^3} = \boxed{x}$

4. $\sqrt[3]{32x^4}$

$\sqrt[3]{8\cdot 4x^3x} = \boxed{2x\sqrt[3]{4x}}$

5. $4x\sqrt[3]{54x^5y^4z^{11}}$

Jan 8-6:37 PM

$$\sqrt[4]{32x^5y^{14}z^{20}}$$

Jan 6-10:19 PM

Jan 4-12:25 PM