GRAB A BOOK

Take notes 6.1

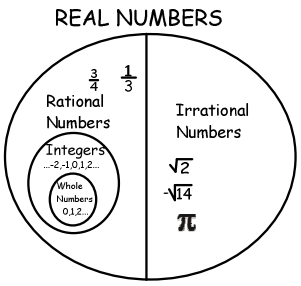
pg 413-416

Feb 12-6:24 PM

Chapter 6. Rational Exponents and Radical Functions. - Unit plan...

Rational Numbers:
Can be written as quotients of integers or Decimals that repeat or terminate

Irrational Numbers:
Cannot be written as quotients or integers or decimals that do not repeat or terminate



Feb 12-1:17 PM

Chapter 6 Powers Roots and Radicals 2/13

6.1 nth roots

the "old" $\sqrt{4} = \sqrt[2]{4}$ (index 2, radicand 4)

what # times itself = 4

the "new" $\sqrt[3]{8}$ (index 3, radicand 8)

what # times itself 3 times = 8

Jan 31-7:55 PM

Old way - only square roots

New way - all kinds of roots

Feb 11-8:51 AM

Write the "n"th root for the following.

n is the index

a is the radicand

$\sqrt[2]{4}$ radicand

1. n = 4, a = 81

$\sqrt[4]{81} = 3$ because $3^4 = 81$

2. n = 3, a = 512

$\sqrt[3]{512} = 8$ $8^3 = 512$

3. n = 5, a = -243

$\sqrt[5]{-243} = -3$ $-3^5 = -243$

4. n = 5, a = -3125

$\sqrt[5]{-3125} = -5$ $-5^5 = -3125$

Jan 29-1:36 PM

How do you write the "nth" root of x as an exponent?

$\left(\sqrt[n]{a}\right)^m = a^{\frac{m}{n}}$

Feb 11-8:55 AM

How do you write the "nth" root of x as an exponent?

1st Job

Exp	Radical	Rational Exponent
$2^3 = 8$	$\sqrt[3]{8} = 2$	$8^{(1/3)} = 2$
$4^3 = 64$	$\sqrt[3]{64} = 4$	$64^{(1/3)} = 4$
$2^4 = 16$	$\sqrt[4]{16} = 2$	$16^{(1/4)} = 2$
$3^4 = 81$	$\sqrt[4]{81} = 3$	$81^{(1/4)} = 3$

Jan 16-10:49 AM

Rewrite from Rational Exponential to Radical $\left(\sqrt[n]{a}\right)^m = a^{\frac{m}{n}}$

$16^{3/2} = \left(\sqrt[2]{16}\right)^3$

$25^{1/2} = \left(\sqrt[2]{25}\right)^1$

$64^{3/2} = \left(\sqrt[2]{64}\right)^3$

$27^{1/3} = \left(\sqrt[3]{27}\right)^1 =$

$8^{2/3} = \left(\sqrt[3]{8}\right)^2$

$81^{2/3} = \left(\sqrt[3]{81}\right)^2$

Jan 10-8:47 AM

Rewrite from Radical to Rational Exponential $\left(\sqrt[n]{a}\right)^m = a^{\frac{m}{n}}$ means fraction

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

$(\sqrt[4]{16})^3 = 16^{\frac{3}{4}}$

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

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

Jan 29-1:30 PM

What are perfect roots?

BUILD A PERFECT ROOT CHART

We'll see these numbers over and over and over again.

Jan 16-10:51 AM

2nd Job Evaluate without a calculator

REWRITE FIRST!!!!

1.) $27^{2/3} = \left(\sqrt[3]{27}\right)^2 = 3^2 = 9$

2.) $(\sqrt[3]{-64})^2 = (-4)^2 = 16$

3.) $8^{-2/3} = \left(\sqrt[3]{8}\right)^{-2} = 2^{-2} = 2^{-\frac{1}{3}} = \frac{1}{4}$

4.) $(\sqrt[4]{16})^{-2} = 2^{-2} = \frac{1}{4}$

Jan 29-1:39 PM

3rd Job...Evaluate with a calculator

1. $\sqrt[4]{27} = 27^{\wedge(\frac{1}{4})} = 2.28$ (Rewrite)

2. $17^{(\frac{2}{3})} = 6.61$

3. $\left(\sqrt[2]{5}\right)^3$ $5^{\wedge(\frac{3}{2})} = 11.18$

4. $\sqrt[7]{43} = 1.71$

Jan 6-8:22 AM

HOW MANY SOLUTIONS WILL WE HAVE...

Can I take the square root of a negative number?

WHY WHY NOT $\sqrt{-4}$

Can I take the even root of a negative number?

Can I take the odd root of a negative number?

Jan 16-8:50 AM

How many solutions will we have

I feel a chart coming on!

	Even Roots	Odd Roots
Positive #'s		
Negative #'s		

Feb 11-8:46 AM

4th Job Solving equations with rational exponents.

YOU MAY NOT TAKE ANY ROOT UNTIL THE TERM IS ISOLATED!!!!!!Q!Q!Q!!

1. $x^2 = 36$

$\sqrt{x^2} = \sqrt{36}$

$x = \pm 6$

2. $\frac{2x^5}{2} = \frac{486}{2}$

$x^5 = 243$

$x = 3$

3. $x^3 + 1 = 28$

$-1 \quad -1$

$\sqrt[3]{x^3} = \sqrt[3]{27}$

$x = 3$

4. $3(x+3)^2 - 3 = 240$

$+3 \quad +3$

$\frac{3(x+3)^2}{3} = \frac{243}{3}$

$\sqrt{(x+3)^2} = \sqrt{81}$

$x+3 = \pm 9$

$x = -3 \pm 9 = 6$ or -12

PEMDAS

Jan 6-8:25 AM

Jan 5-8:09 AM