MRS21-Lesson-11 Mr. Pineda

Aim: How do we rewrite expressions involving radicals and rational exponents using the properties of exponents? (Section 6-1)

Do now:

Simplify each expression. Use only positive exponents.

take note

Properties **Properties of Exponents**

- $a^0 = 1, a \neq 0$
- $\frac{a^m}{a^n} = a^{m-n}$
- $a^{-n} = \frac{1}{a^n}$
- $(ab)^n = a^n b^n$
- $(a^m)^n = a^{mn}$
- $a^m \cdot a^n = a^{m+n}$
- $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$

1. $(2a^3)(5a^4)$
2. $(-3x^2)(-4x^{-2})$
3. $(3x^2y^3)^2$
4. $(3x^{-4}y^3)^2$
5. $\frac{4a^8}{2a^4} = \frac{2 \cdot 2 \cancel{a}\cancel{a}\cancel{a}\cancel{a}\cancel{a}\cancel{a}\cancel{a}\cancel{a}}{2\cancel{a}\cancel{a}\cancel{a}\cancel{a}}$
6. $\frac{12x^5y^3}{4x^{-1}}$

Answers:

1) $10a^7$

2) $+12x^0 = 12$

3) $9x^4y^6$

4) $9x^{-8}y^6$

$(3x^{-4}y^3)^2 = (3x^{-4}y^3)(3x^{-4}y^3)$

$x^{-4} \cdot x^{-4} = x^{-4+-4} = x^{-8}$

FOR $\frac{9y^6}{x^8}$

5) $2a^4$

6) $3x^6y^3$

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Reasoning Your friend tells you that $(k^2)^{-5} = -k^{10}$. Did she apply the properties of exponents correctly? Explain why or why not.

NO CORRECT

CORRECT k^{-10} OR $\frac{1}{k^{10}}$

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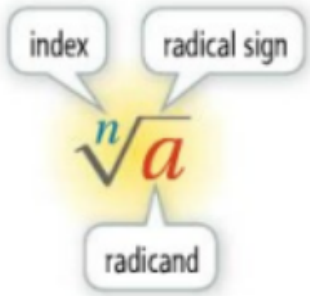
I- Finding all real roots

1)



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2)

Find all the real square roots of each number.

1. 625

$\sqrt{625} = \pm 25$

$25 \times 25 = 625$

$-25 \times -25 = 625$

2. -1.44 =

No Real Root

$\sqrt{-1.44}$

3. $\frac{16}{81}$

$\sqrt{\frac{16}{81}} = \pm\frac{4}{9}$

3)

Find all the real cube roots of each number.

4. -216 **5.** $\frac{1}{64}$ **6.** 0.027

$\sqrt[3]{-216} = -6$ $\sqrt[3]{\frac{1}{64}} = \frac{1}{4}$ $\sqrt[3]{0.027} = 0.3$

II- Simplifying Radical Expressions

1)

take note

Property *n*th Roots of *n*th Powers

For any real number a, $\sqrt[n]{a^n} = \begin{cases} a \text{ if } n \text{ is odd} \\ |a| \text{ if } n \text{ is even} \end{cases}$

Piecewise equations (choice)

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2) Simplify each radical expression. Use absolute value symbols when needed. To start, write the factors of the radicand as perfect squares, cubes, or fourths.

1. $\sqrt{25x^6}$

$= \sqrt[2]{(5)^2(x^3)^2}$ $= \sqrt[2]{(5x^3)^2}$

$= 5|x^3|$ $= |5x^3|$

$= 5x^3$

2. $\sqrt[3]{343x^9y^{12}}$ = No problem

3. $\sqrt[4]{16x^{16}y^{20}} = \sqrt[4]{(2x^4y^5)^4}$

$2x^4|y^5|$

III- Using Radical Expressions

Academics Some teachers adjust test scores when a test is difficult. One teacher's formula for adjusting scores is $A = 10\sqrt{R}$, where A is the adjusted score and R is the raw score. If the raw scores on one test range from 36 to 90, what is the range of the adjusted scores?

on your own !

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