

Aim: How do we rewrite involving radicals and rational exponents using the properties of exponents?

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

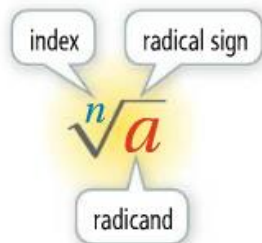
5. $\frac{4a^8}{2a^4}$

6. $\frac{12x^5y^3}{4x^{-1}}$

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

I- Finding all real roots

1)



Find all the real square roots of each number.

2)

1. 625

2. -1.44

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

Find all the real cube roots of each number.

3)

4. -216

5. $\frac{1}{64}$

6. 0.027

II- Simplifying Radical Expressions

1)



Property n th Roots of n th Powers

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

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. $\sqrt{25x^6}$

2. $\sqrt[3]{343x^9y^{12}}$

3. $\sqrt[4]{16x^{16}y^{20}}$

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

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?