

Solving Radical Equations

3.28.16

L24

Warm-up

$$1) (x + 3)^{\frac{1}{2}} - 3 = 6$$

$$2) (x - 2)^{\frac{1}{3}} + 2 = 3$$

$$3) \text{Simplify } 8^{\frac{2}{3}}$$

$$4) \frac{3x^2y^3}{6xy^5} =$$

$$5) (5x^2)(2x^3y^3)$$

What do negative exponents do?

$$5^{-2} =$$

$$x^{-4} =$$

What do exponential fractions do?

How to rewrite exponential fractions.

I Try:

$$9^{\frac{2}{3}} = \sqrt[3]{9^2} = \sqrt[3]{(3^2)^2} = \sqrt[3]{3^4} = 3^{\frac{4}{3}} = 3^{\frac{3}{3}} \cdot 3^{\frac{1}{3}} = 3 \sqrt[3]{3}$$

We Try:

$$81^{\frac{3}{4}}$$

I try:

$$\left(\frac{9}{16}\right)^{-\frac{2}{3}} =$$

Eliminate the negative exponents by applying the reciprocal.	
Apply the exponents to each part	
Simplify	

We Try:

$$(36x^4)^{-\frac{1}{2}} =$$

Eliminate the negative exponents by applying the reciprocal.	
Apply the exponents to each part	
Simplify	

I Try:

$$\sqrt[3]{81x^5y^{\frac{1}{6}}}$$

Find the prime factorization	$\sqrt[3]{3^4x^5y^{\frac{1}{6}}}$
Separate them (optional)	$\sqrt[3]{3^4} \sqrt[3]{x^5} \sqrt[3]{y^{\frac{1}{6}}}$
Simplify them	$3\sqrt[3]{3} x \sqrt[3]{x^2} \sqrt{y}$

I do:

$$(x + 1)^{\frac{3}{2}} - 2 = 6$$

Isolate the exponential expression	$(x + 1)^{\frac{3}{2}} = 6 + 2$ $(x + 1)^{\frac{3}{2}} = 8$
Raise both sides to the reciprocal exponent	$\left((x + 1)^{\frac{3}{2}} \right)^{\frac{2}{3}} = 8^{\frac{2}{3}}$
Simplify	$(x + 1) = 8^{\frac{2}{3}}$
Rewrite as a prime factorization	$(x + 1) = (2^3)^{\frac{2}{3}}$
Simplify	$(x + 1) = 2^{3 \cdot \frac{2}{3}}$ $(x + 1) = 2^2$ $(x + 1) = 4$ $x = 3$

We Try:

$$3(x)^{\frac{3}{4}} - 3 = 78$$

Isolate the exponential expression	
Raise both sides to the reciprocal exponent	
Simplify	
Rewrite as a prime factorization	
Simplify	

We Try:

$$4(x)^{\frac{3}{4}} - 3 = 61$$

Isolate the exponential expression	
Raise both sides to the reciprocal exponent	
Simplify	
Rewrite as a prime factorization	
Simplify	

You Try with your partner:

$$2(x)^{\frac{3}{2}} - 3 = 247$$

Isolate the exponential expression	
Raise both sides to the reciprocal exponent	
Simplify	
Rewrite as a prime factorization	
Simplify	