Seat Work after the test

Exploration of Rational Exponents Name________________________________

Using your calculator, complete the following table.

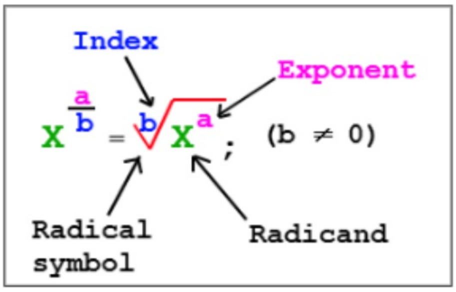
Expression	Numerical Value	Expression	Numerical Value
$(4)^{\boxed{\frac{1}{2}}} = ?$	2	$\sqrt[2]{4^1} = \sqrt{4} = ?$	2
$(64)^{\boxed{\frac{1}{3}}} = ?$	4	$\sqrt[3]{64^{\boxed{1}}} = ?$	4
$(8)^{\boxed{\frac{2}{3}}} = ?$	4	$\sqrt[3]{8^2} = ?$	4
$(16)^{\frac{1}{4}} = ?$	2	$\sqrt[4]{16^1} = ?$	2
$(25)^{-\frac{1}{2}} = ?$	$\frac{1}{5}$	$\left(\sqrt[2]{25}\right)^{-1} = \frac{1}{\sqrt{25}} = ?$	$\frac{1}{5}$
$\left(2^3\right)^{\frac{1}{2}} = ? \approx$	2.828	$\sqrt[2]{(2)^3} = ? \approx$	2.828

Yesterday, you practiced rewriting radical expressions into radical expressions into radical and rational exponent notation. Let's review what you observed:

1. What did you notice about your answers to the problems in the same row?

They are the same

2. Is there some pattern that relates the two expressions in each row to one another? Describe the pattern.



Use the cut-out pieces to solve the Square Root Equation.
Glue them down AFTER your order has been checked.

Start Here: 1 $9+\sqrt{9-x}=11$ ① Subtract 9 from both sides

2 $\sqrt{9-x}=2$ ② Squared both sides

$\left(\sqrt{9-x}\right)^2=2^2$ ③ Simplify

$9-x=4$ ④ Subtract 9 from both sides

? $-1x=-5$

$x=5$ ⑤ Divide by -1 on both sides

You probably noticed that solving a Square Root Equation is very similar to solving Quadratic Equations by the Square Root Method. Let's try a few more together!

Recall that $(\ )^2$ "undoes" $\sqrt{\ }$

Solving with One Radical

A) $-8 + \sqrt{5x - 5} = -3$

$+8 \qquad +8$

$\left(\sqrt{5x-5}\right)^2 = (5)^2$

$5x - 5 = 25$

$5x - 5 = 25$

$+5 \quad +5$

$\frac{5x}{5} = \frac{30}{5}$

$\boxed{x = 6}$ ✓

B) $9 + 5\sqrt[3]{2x} = 29$

$-9 \qquad -9$

$\frac{5\sqrt[3]{2x}}{5} = \frac{20}{5}$

$\left(\sqrt[3]{2x}\right)^3 = (4)^3$

$\frac{2x}{2} = \frac{64}{2}$

$\boxed{x = 32}$ ✓

C) $\left(\sqrt{90 - x}\right)^2 = (x)^2$

$90 - x = x^2$

$-90 + x \qquad +x - 90$

$x^2 + x - 90 = 0$

$(x - 9)(x + 10) = 0$

$x - 9 = 0 \qquad x + 10 = 0$

$\boxed{x = 9}$ ✓ $\qquad \cancel{\boxed{x = -10}}$

We used the same four steps to solve each of the three radical equations. What are they?

Step #1: Isolate the radical

Step #2: Raise each side to the power of the index

Step #3: Solve for X

Step #4: Check for Extraneous Solutions, which means

there some answers we get algeb. that do not make our original true

Solving with Two Radicals

A) $\left(\sqrt[3]{4x-9}\right)^3 = \left(\sqrt[3]{2x-4}\right)^3$

$$4x-9=\cancel{2x}-4$$
$$-2x \qquad -\cancel{2x}$$

$$2x-9=-4$$
$$+9 \qquad +9$$

$$\frac{2x}{2}=\frac{5}{2}$$

$$\boxed{x=\frac{5}{2}}\ \checkmark$$

B) $\left(\sqrt[4]{3x+3}\right)^4 = \left(\sqrt[4]{2x-7}\right)^4$

$$\boxed{x=-10}$$

How did our steps change when there were two radicals instead of one?

You have now seen two different types of Radical Equations that can be solved. In each type, we had to make sure we always checked for Extraneous Solutions!! This is **VERY** important to remember.

Now, practice solving the following equation on your own:

$$6 + 3w = \sqrt{2w + 12} + 2w$$

**Link to the video will be posted on my website: kgrimmrhs.weebly.com !! :)

Homework is on Page 1 of the Packet!