Name ____________________

5-2 Reteach to Build Understanding

Properties of Exponents and Radicals

1. Complete the table.

	Meaning (assuming bases are equal)	Algebra	Numbers
Product of Powers	**Add the exponents**	$x^a \cdot x^b = x^{a+b}$	$2^3 \cdot 2^2 = \underline{\quad}^{3+2} = 2\underline{\quad}$
Quotient of Powers	**Subtract the exponents**	$\frac{x^a}{x^b} = x^{a-b}$	$\frac{2^3}{2^2} = 2\underline{\quad}^{-2} = \underline{\quad}^{1}$
Power of a Power	**Multiply the exponents**	$(x^a)^b = x^{a \cdot b}$	$(2^3)^2 = 2\underline{\quad}\cdot\underline{\quad} = \underline{\quad}^{6}$
Power of a Product	**Distribute each exponent to each term**	$(xy)^a = x^a y^a$	$(2 \cdot 4)^3 = \underline{\quad}^{3}\underline{\quad}^{3} = \underline{\quad} \cdot 64$
Negative Exponent	**Change the sign of the exponent and write the reciprocal**	$x^{-a} = \frac{1}{x^a}$	$2^{-}\underline{\quad} = \frac{1}{2^3}$

2. Drew was asked to simplify the expression $\sqrt[4]{6x} \cdot \sqrt[3]{4x}$. His final solution was 55,296x. Look at his work and circle where he made his mistake. Then write the correct answer.

$$\sqrt[4]{6x} \cdot \sqrt[3]{4x}$$
$$(6x)^{\frac{1}{4}} \cdot (4x)^{\frac{1}{3}}$$
$$(6x)^{\frac{3}{12}} \cdot (4x)^{\frac{4}{12}}$$
$$\left((6x)^3 \cdot (4x)^4\right)^{\frac{1}{12}}$$
$$(216x^3 \cdot 256x^4)^{\frac{1}{12}}$$
$$\sqrt[12]{55{,}296x^{12}} = 55{,}296x$$

3. What is the sum of $\sqrt{12} + \sqrt[3]{54} - \sqrt{3} - \sqrt[3]{128}$? Fill in the blanks.

$\sqrt{12} - \sqrt{3} + \sqrt[3]{54} - \sqrt[3]{128}$	Group radical terms with like indices.
$2\sqrt{\underline{\quad}} - \sqrt{3} + \underline{\quad}\sqrt[3]{2} - 4\sqrt[3]{2}$	Simplify each radical term.
$(2 - \underline{\quad})\sqrt{\underline{\quad}} + (\underline{\quad} - 4)\sqrt[3]{2}$	Factor out the radicals using the Distributive Property.
$\sqrt{3} - \sqrt[3]{\underline{\quad}}$	Combine like radical terms.