Name ____

5-1 Reteach to Build Understanding

*n*th Root, Radicals, and Rational Exponents

1. Use the pattern in the top row to convert from the radical form to the exponential form. Fill in the blanks in the table to complete the table.

Radical	Exponential	Fractional Exponent
$\sqrt[n]{c^m}$	$(c^m)^{\frac{1}{n}}$	$c^{\frac{m}{n}}$
$\sqrt[4]{22^4}$	$(\underline{\quad}^{4})^{\frac{1}{4}}$	$22^{\frac{4}{\underline{\quad}}}$
$\sqrt[6]{166^3}$	$(166^{\underline{\quad}})^{\frac{1}{6}}$	$166^{\frac{\underline{\quad}}{6}}$
$\sqrt[8]{6^5}$	$(6^5)^{\frac{1}{\underline{\quad}}}$	$6^{\frac{5}{8}}$

Remember that the index of a radical, *n*, is equivalent to the denominator of a fractional exponent.

The exponent of the radicand, *m*, is equivalent to the numerator of a fractional exponent.

2. Charlie needed to simplify $(64x^6y^{12})^{\frac{2}{3}}$.

First, he found the square root of the term $8x^3y^6$.

Then he cubed each term, which gave him a final answer of $512x^9y^{18}$.

a. What mistake did he make and what should he have done instead?

b. Choose the correct answer from the following options, if Charlie had not made a mistake.

Ⓐ $16x^{16}y^4$

Ⓑ $16x^9y^{18}$

Ⓒ $16x^4y^8$

Ⓓ $16x^6y^{12}$

3. Solve the equation by filling in the blanks.

Step 1: $5x^4 = 405$ — Write the original equation.

Step 2: $5x^4 - 405 = 0$ — Rearrange to equal zero.

Step 3 $5(x^4 - 81) = 0$ — Factor out 5.

Step 4: $(x^4 - 81) = 0$ — Divide both sides by 5.

Step 5: $(x^2 + \underline{\quad\quad})(x^2 - \underline{\quad\quad}) = 0$ — Factor using the conjugate identity.

Step 6: $(x^2 + \underline{\quad\quad})(x - 3)(x + \underline{\quad\quad}) = 0$ — Factor the right parentheses using the difference of squares pattern.

Step 7: $x = \pm \underline{\quad\quad}$ — Set each factor equal to zero and solve.