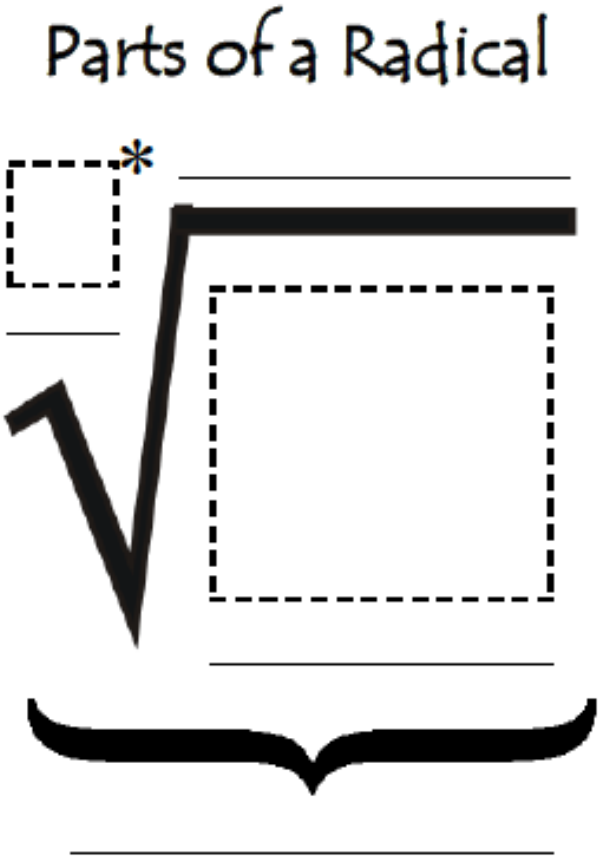
Algebra 1: 5.5 Guided Notes – Part 1 **Name** _____ **Period** _____
Properties of Rational Exponents

Learning Goals
- *Write an expression in radical form.*
- *Find the nth root of a number.*

If $\underbrace{5 \cdot 5 \cdot 5}_{3} = 5^3 = 125$, then _____.



For each radical, determine the index and the radicand.

1. $\sqrt{24}$
   index = _____
   radicand = _____

2. $\sqrt[4]{16xy^2}$
   index = _____
   radicand = _____

3. $\sqrt[3]{-162}$
   index = _____
   radicand = _____

If the _____ is not written, it is automatically a _____.

A number ***a*** is a _____ of ***b*** if $a^3 = b$. Thus, 5 is a _____ of 125 because _____ = $\underbrace{5 \cdot 5 \cdot 5}_{3}$ = _____.

Complete each statement

1. $\sqrt[3]{8}$ = ___ because _____ 2. $\sqrt[3]{64}$ = ____ because _____ 3. $\sqrt[3]{27}$ = ____ because _____

If ***n*** represents a positive number, then ***a*** is the ***nth root*** of ***b*** if $a^n = b$.

For example, 5 is the _____ of 625 because _____ = $\underbrace{5 \cdot 5 \cdot 5 \cdot 5}_{4}$ = _____.

Complete each statement.

1. The number 2 is the 4^{th} root of 16 because _____.
2. The number 3 is the _____ root of 243 because $3^5 = 243$.
3. The number –2 is the cube root of –8 because _____.
4. The number 4 is the _____ root of 4096 because $4^6 = 4096$.

The ***n*th** root of a number ***b*** is designated as $\sqrt[n]{b}$, where ***n*** is the index of the radical and ***b*** is the radicand.

For example, $\sqrt{100} = 10$ because _____.

Complete each statement.

1. $\sqrt[3]{216} = 6$ because _____ = _____.
2. $\sqrt[4]{81} = 3$ because _____ = _____.
3. _____ = _____ because $(-2)^5 = -32$.

A power can be positive (+) or negative (–) depending on the base and the exponent.

Base	***Exponent***	***Power***	***Example***
Positive (+)	Even number (2, 4, 6…)		
Negative (–)	Even number (2, 4, 6…)		
Positive (+)	Odd number (1, 3, 5…)		
Negative (–)	Odd number (1, 3, 5…)		