**6.1 Roots and Radical Expressions**

Objectives: To find nth roots.

**nth root of a**: for an integer n greater than 1,

b is an nth root of a if **bn = a**

Key Terms when talking about Roots and Radical Expressions.

**Roots:** The answer/solution (we talked about this a lot in Chapter 5)  
**Radical:** An expression that uses a root  
**Radicand:** The number under a radical  
**Index:**Gives the degree of the root (small number in front/on top of the radical)

|  |  |  |
| --- | --- | --- |
|  | **Equation** | **Example** |
| Odd exponent (n),  any number (a) | **ONE REAL SOLUTION** |  |
| Even exponent (n), positive number (a) | **TWO REAL SOLUTIONS** |  |
| Even exponent (n), negative number (a) | **TWO IMAGINARY**  **SOLUTIONS** |  |
| Zero (a) | **ALWAYS ZERO** |  |

**Real nth Roots**;

*Let n be an integer greater than 1 and let a be a real number;* n√a

**Example:**

1. **2.) 3.) 4.) 5.)**

**nth Roots of nth Powers**  
For any real number a,

**In other words, When Variables are Involved**;

|  |  |  |
| --- | --- | --- |
| n is odd |  | and |
| n is even |  | and |

**Example:**

Note: if 3 in #3 and #4 were an x then both 3   
and -3 would be the answer

**Simplifying Radical Expressions**You can split the parts being multiplied into separate radicals with the same index.

**\*Example:**



Odd index, can’t include any absolute value symbols.

**\*Note:** If after simplifying a radical with an even exponent, and you get an odd exponent make sure you take its absolute value.   
 **HMWK: page 364 #4-7, 22-30, 36**