

## Algebra 2C Notes

Name: \_\_\_\_\_

### 6-5 Solving Square Root and Other Radical Equations

Date: \_\_\_\_\_ Hr: \_\_\_\_\_

#### Objectives:

- To solve square root and other radical equations.

#### Common Core Standards

**A.RE1.2** Solve simple rational and radical equations in one variable, and ...show how extraneous solutions may arise.

**A.CED.4** Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

A \_\_\_\_\_ equation is an equation that has a variable in a radicand or a variable with a rational exponent. If a radical has index 2, the equation is a \_\_\_\_\_ equation.

Solving a square root equation may require that you square each side of the equation. This can introduce \_\_\_\_\_ solutions which are solutions of the simplified form that do not satisfy the original equation.

To solve a radical equation, isolate the radical on one side of the equation. Then raise each side to the power suggested by the index.

#### **Example 1: Solving a Square Root Equation**

What is the solution of  $\sqrt{x+4} + 6 = 7$ ?

**Example 2: Solving Other Radical Equations**

What is the solution of  $(6x + 9)^{1/3} - 5 = -2$ ?

**Example 3: Using Radical Equations**

A parabolic goblet with a cup that is as wide as it is tall holds  $1.74r^3$  oz. of water when full, where  $r$  is the radius in inches of the circular rim. What is the radius, to the nearest hundredth of an inch, of a goblet that holds 9 oz?

When you raise each side of an equation to a power, it is possible to introduce extraneous solutions. Therefore, it becomes very important that you check all solutions in the original equation. A correct solution will give a true statement. An extraneous solution will give a false statement.

**Example 4: Checking for Extraneous Solutions**

What is the solution of  $\sqrt{5x + 14} = x$ ?

Check your results.

If an equation contains two radical expressions (or two terms with rational exponents), isolate one of the radicals (or one of the terms), then eliminate it (or its rational exponent). Isolate the more complicated radical expression first. In the resulting equation, simplify the expressions before you eliminate the second radical.

**Example 5: Solving an Equation with Two Radicals**

What is the solution of  $2 + \sqrt{x - 6} = \sqrt{x + 10}$ ?

