

## Algebra 2B Notes

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

### 7-5 Exponential and Logarithmic Equations

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

#### Objective:

- To use solve exponential and logarithmic equations

#### Common Core Content Standard:

**F.LE.4** For exponential models, express as a logarithm the solution to  $ab^{ct}$  where  $a$ ,  $c$ , and  $d$  are numbers and the base  $b$  is 2, 10, or  $e$ ; evaluate the logarithm using technology.

Any equation where the exponent includes a variable is an \_\_\_\_\_ equation.

You can use \_\_\_\_\_ to solve exponential equations. You can use \_\_\_\_\_ to solve logarithmic equations.

#### **Example 1: Solving an Exponential Equation – Common Base**

What is the solution of  $256^{2x} = 64$

When bases are not the same, you can solve an exponential equation by taking the \_\_\_\_\_ of each side of the equation. If  $m$  and  $n$  are positive and  $m = n$ , then  $\log m = \log n$ .

#### **Example 2: Solving an Exponential Equation – Different Bases**

What is the solution of  $6^{4x} = 512$ ?

#### **Example 3: Solving an Exponential Equation with a Graph or Table**

What is the solution of  $5^{2x} = 3500$ ??

**Example 4: Modeling with an Exponential Equation**

Your MP3 player has about 126,000,000 bytes of memory. Each month you plan to use 5% of the memory remaining. How many months will it take you to use  $\frac{1}{4}$  of the memory?

A \_\_\_\_\_ equation is an equation that includes one or more logarithms including a variable.

**Example 5: Solving a Logarithmic Equation**

What is the solution of  $\log(5x+2) = 2$ ?

**Example 6: Using Logarithmic Properties to Solve an Equation**

What is the solution of  $\log 2x^2 - \log 5 = 1$ ?