**Barron’s Let’s Review Regents – Algebra I**

# Chapter 8: Exponential Equations

## 8.1 Solving Exponential Equations

An exponential equation is one where the variable is an exponent. An example of a one-variable exponential equation is . Examples of two variable exponential equations are and   
.

**Finding Solutions to Exponential Equations**

In a two-variable equation like , substitute values for x, and find the corresponding y to get the solution. For example, if , then .

**Math Facts**

When a number other than 0 is raised to the 0 power, it becomes 1, not 0.

**Solving for the Exponent in an Exponential Equation**

In a one-variable exponential equation where the exponent is unknown, isolate the exponential expression and then use guess and check.

**Example**

Solve for the equation .  
The last step was done by guess and check.

**Check Your Understanding of Section 8.1**

1. Multiple-Choice
2. If and , solve for y.  
   **(2) 9**
3. If and , solve for y.  
   **(3) 54**
4. If and , solve for y.  
   **(3) 1**
5. If and , solve for y.  
   **(4) 5**
6. If , and , solve for y.  
   **(3)**
7. If and , solve for x.  
   **(4) 3**
8. If and , solve for x.  
   **(1) 7**
9. If and , solve for x.  
   **(2) -3**
10. If and , solve for y.  
    **(4) 8**
11. If and , solve for y rounded to the nearest hundredth.  
    **(1) 2.70**
12. Show how you arrived at your answers.
13. Phoebe put $500 into the bank. The amount of money she has after t years is determined by the equation . After 4 years, how much money will Phoebe have in the bank.  
      
    Using Scientific Calculator:
14. The population of a town after t years can be approximated by the equation   
    . (a) According to the formula, what will the population of the town be after 10 years? (b) In what year will the population become 14,065?  
      
    (a)   
      
    (b) 15th year
15. Zoe drinks a cup of coffee that has 100 mg of caffeine. The amount of caffeine in the bloodstream after t hours can be determined by the equation . How much caffeine will be left in her bloodstream after 20 hours?
16. Food that is 110 degrees is put into a 30-degree freezer. The temperature of the food is related to the number of hours the food is in the freezer by the equation   
    . Between which two hours will the food be 32 degrees?  
      
    **Between 10 and 11 hours.**
17. Daphne says that is always greater than . Julia says that this is not true and that sometimes is greater than . Which student is correct? Explain.  
      
    Julia is correct.  
      
    For , will be greater than .

x 5^x 6^x  
 -1 0.20000 0.16667

-2 0.04000 0.02778

-3 0.00800 0.00463

-4 0.00160 0.00077

-5 0.00032 0.00013

-6 0.00006 0.00002