

Algebra 2
7-5 Exponential & Log Equations

Name _____

Date _____ **A#3**



Goal: To solve exponential and logarithmic equations

Example 1: Solving by Equating Exponents

a. Solve $2^{2x} = 16$

b. Solve $27^{2x} = 9^{x+2}$

Practice:

1. $7^c = 343$

2. $25^{2n+1} = 125$

Example 2: Taking Log of Both Sides

a. $4^x = 21$

b. $4^x - 5 = 20$

Practice:

3. $5^{2x} = 20$

4. $15^{2n-3} - 10 = 235$

Example 3: Exponentiating Each Side

a. $\log_3(2x+3) = 3$

b. $\log_6(17x+2) = 2$

Example 4: Solving Logarithmic Equations

a. $\log_7(3x-1) = \log_7(2x+2)$

b. $\log x - \log 4 = 3$



c. $2\log x = 2$

d. $\log(x+21) + \log x = 2$

Practice

5. $\log 3x - \log 5 = 1$

6. $\log 3x = 2$

Example 5: Application

The equation $y = 281(1.01)^x$ is a model for the population of the United States y , in millions of people, x years after the year 2000. Estimate when the United States population will reach 400 million people.

Practice: The function $y = 1000(1.005)^x$ models the value of \$1000 deposited at an interest rate of 6% per year (0.005 per month) x months after the money is deposited. Predict how many months it will be until the account is worth \$1100. Predict how many years it will be until the account is worth \$5000.

$$4^x - 5 = 12$$