Logarithm Overview

**Write each equation in logarithmic form.**

**1.** 64 = 82 **2.** 8 = 23  **3.** 125 = 53 **4.** 729 = 36

**Evaluate each logarithm.**

**5.** log3 243 **6.** log5 625 **7.** log9 729 **8.** log4 256

**9. Reasoning** Find the value of log8 64 without using a calculator. Justify your answer.

**Write each expression as a single logarithm.**  
**10.** log5 3 + log5 6 **11.** log2 32 − log2 8 **12.**   
  
  
**Expand each logarithm.**  
**13.** **14.**  **15.** 

**Identify transformations from parent, domain, range, key point, and vertical asymptote.**

**16.** y = log ( x – 1) + 3 **17.** y = –log( x + 5)

**Solve each equation.**

**18. **  **19.** 2 − 4*x* = −62 **20.** log *x* + log 2 = 5 **21.** log3 (*x* + 1) = 4

**22.** log 4*x* = −1 **23.** log 4 − log *x* = −2 **24.** 4 + 5*x* = 29 **25.** log(2x) = log (10)

**26.** 4*x* = 16 **27.** 9*y*−3 = 8 **28.** log(x/3) = 2 **29.** *y =* log 4 (*x +* 1)

**30.** You can use the equation *N =* *k* log *A* to estimate the number of species *N* that live in a region of area *A*. The parameter *k* is determined by the conditions in the region. In a rain forest, 2700 species live in 500 km2. How many species would remain if half of the forest area were destroyed by logging and farming?