

name: \_\_\_\_\_

## Assignment 5

Math621B

due 9am October 15, 2007

1. Use a law of logarithms to evaluate  $\log_3 56$  given that  $\log_3 8 = 1.893$  and  $\log_3 7 = 1.771$
2. Evaluate  $\log_5 1000 + \log_5 \frac{1}{40}$
3. Solve for  $x$ :  
 $\log_5 x + 4 \log_5 2 = 2 \log_5 8$
4. Find the roots of the equation. Check for restrictions and reject any inadmissible roots.  
 $\log_3 x + \log_3 (x - 6) = 3$
5. How long will it take for an investment to double if it is invested at a rate of 7% compounded semi-annually?
6. A sample of Palladium- 243 decays to just 1.5625% of its original mass in 24 hours. Find its half-life.

7. Evaluate  $\log_6 82$  to three decimal places.

8. Solve for  $x$   $4^{2x-3} = \left(\frac{1}{16}\right)^{x+1}$

9. Find the doubling period for a type of bacteria that has increased from 3000 to 5000 in 40 minutes.

10. The population of Carterville has been declining continuously at a rate of -1.8% a year. If the population was 24 510 at the beginning of 2006, how many people lived there at the beginning of the year 2001 (to the nearest 1000)?