Integrated Math 3
12.4 (Day 2) Worksheet

Name KEY
Date _____ Period _____

Section 1: Rewrite the equations in exponential form.

1. $log_3 81 = 4$ → $3^4 = 81$
2. $log_7 1 = 0$ → $7^0 = 1$
3. $log_{12} 12 = 1$ → $12^1 = 12$
4. $log_{\frac{1}{4}} 64 = -3$ → $\left(\frac{1}{4}\right)^{-3} = 64$

Section 2: Rewrite the equations in logarithmic form.

5. $5^3 = 125$ → $\log_5 125 = 3$
6. $3^{-3} = \frac{1}{27}$ → $\log_3 \frac{1}{27} = -3$
7. $5 = 25^{\frac{1}{2}}$ → $\log_{25} 5 = \frac{1}{2}$

Section 3: Evaluate each logarithm.

8. $log_3 27 = x$
$3^x = 27$
$3^x = 3^3$
$x = 3$

9. $log_4 8 = x$
$4^x = 8$
$2^{2x} = 2^3$
$2x = 3$
$x = \frac{3}{2}$

10. $log_2 \frac{1}{4} = x$
$2^x = \frac{1}{4}$
$2^x = 2^{-2}$
$x = -2$

11. $log_{64} 4 = x$
$64^x = 4$
$4^{3x} = 4^1$
$3x = 1$
$x = \frac{1}{3}$

12. $log_{\frac{1}{3}} 81 = x$
$\left(\frac{1}{3}\right)^x = 81$
$3^{-1x} = 3^4$
$-1x = 4$
$x = -4$

13. $log_{\frac{1}{5}} 625 = x$
$\left(\frac{1}{5}\right)^x = 625$
$5^{-1x} = 5^4$
$-x = 4$
$x = -4$

14. For each problem in Section 3, what did your answer represent? What were you solving to find? An exponent!!!.

Section 4: Use your calculator to evaluate the logarithm. Round to the nearest thousandth.

a. $log\ 17$ → 1.230

b. $log\ -12$ → DNE

c. $log\ .0524$ → −1.281