

**Logs...let's build a cabin!** $a = \log_b c$  means \_\_\_\_\_Solve for  $p$ . (Round to 3 decimal places).

1.  $84^p = 70$

2.  $\log_5 p = 4$

3.  $\log_p 35 = 3$

4.  $\log_2(10+3p) = 5$

5.  $\log_8(p+1) - \log_8 p = 2$

6.  $\log_5(5x) = 2 + \log_5(x-4)$

7.  $\log(p+3) + \log(p-3) = \log(16)$

8.  $\log(3p+1) - \log(p-2) = 1$

9.  $5^{(4p-7)} = 125$

10.  $3^{7p} = \frac{1}{27}$

11.  $\ln(\ln p) = 2$

12.  $\log_3(\log_4 p) = 0$

13.  $\log_8 p + \log_8(p+12) = 2$

Simplify the following. Then, evaluate the expression. (Round to 3 decimal places).

14.  $3\log_3 4 - (\log_2 6 + \log_3 4)$

15.  $-2\log_5 40 + \log_5 100 - \log_5 10$

16. Why do we need to use the change of base formula?

Evaluate the following to 3 decimal places. Show what you punched into the calculator:

17.  $\log_4 12$

18.  $\log_{70} 35$

19.  $\log_{\frac{1}{3}} 28$

20. *Population Growth of the Virgin Islands.*

The population of the U.S. Virgin Islands has a growth rate of 2.6% per year. In 1990, the population was 512,000. The land area of the Virgin Islands is 3,097,600 square yards. Assuming this growth continues and is exponential, after how long will there be one person for every square yard of land?

21. **America is eating less beef.** The average consumption of beef is decreasing exponentially by approximately 1.6% per year. In 1985, the average annual consumption was about 80 lb. per person.

a). Write an equation to show how the consumption has changed since then.

b). Use your equation to estimate the consumption of beef in the year 2006.

c). After how many years (theoretically) will the average be 20 lb. per person?