Trigonometry/Precalculus
Logarithm Practice
Day _____

Name
Date
Block

1) Solve each of the following without a calculator. (To what power must you raise 10 in order to get 100?)

a) $\log 10 = ?$ b) $\log 1000 = ?$ c) $\log \sqrt{10} = ?$

d) $\log 0.01 = ?$ e) $\log (-0.01) = ?$ f) $\log \left(\sqrt[5]{10}\right)^3 = ?$

g) $\log \sqrt[5]{1000} = ?$ h) $\log 0 = ?$ i) $\log\left(\frac{1}{\sqrt[3]{10}}\right) = ?$

2) Logs will work for any base.
Examples: $\log_3 81 = 4$ because $3^4 = 81$. $\log_2 32 = 5$ because $2^5 = 32$.
Copy and complete:

a) $\log_2 8 = 3$ because… b) $\log_6 1296 = 4$ because…

c) $\log_7\left(\frac{1}{49}\right) = -2$ because… d) $\log_9 3 = \frac{1}{2}$ because…

3) Every one of these log equations can be rewritten as an exponential equation, and vice versa. Copy each equation shown below. Then rewrite it in the other form.

a) $y = 7^x$ b) $\log_4 x = y$ c) $11^y = x$

d) $W^K = B$ e) $K = \log_W B$ f) $\log_{1/3} P = Q$

4) Using the conclusions from the previous problem, simplify the following.

a) $\log_3 3^5$ b) $\log_k k^{-4}$

c) $7^{\log_7 12}$ d) $K^{\log_K 4x}$

5) Graph the functions $f(x) = 3^x$ and $g(x) = \log_3 x$. State the domain, range and zeros of each function.

6) Egnarts has a calculator which is as strange as he is. His calculator has a log key that is labeled "LS" and has no base. When he enters LS 3, the display reads .5645750, LS 10 = 1.183295, and LS 7 = 1.

a) Find LS 1.

b) What is the base for the strange "LS" log key? Which of the given facts leads to this answer?

c) Egnarts' calculator has another mystery log key, LV. LV .2 = -1, and LV 25 = 2. Find the base. Explain how you did it.

d) LV x = -2 and LV y = .5. Find the exact values for x and y.

7) Find each logarithm.

a) $\log_{36} 6$ b) $\log_4 \frac{1}{64}$

c) $\log_9 27$ d) $\log_5 1$

e) $\log_4 8$ f) $\log 0.001$

8) Factor.

a) $4x^2 - y^2$ b) $9z^4 - y^2$

c) $2x^4 - 8y^2$

9) Express each equation in exponential form.

a) $\log_\pi \pi = 1$ b) $\log_{\sqrt{3}} 9 = 4$ c) $\log_6 1 = 0$

10) Find each logarithm. (Do not use a calculator.)

a) $\log_5 \frac{1}{125}$ b) $\log_5 \sqrt[3]{5}$

c) $\log_2 64$ d) $\log_4 64$

11) Find each of the following values of x.

a) $log_{16}x = 4$ b) $log_3 x = 4$ c) $log_3 x = -1$ d) $log_5 x = 2$ e) $log_9 x = \frac{1}{2}$