H. Math 2... 10/31 HW...

Common Logs...take home assignment due 11/1 Name _____

Common logs have the property: $\log_{10}(10^a) = a$. When you press the "log" button on your calculator, you default to $\log_{10}$.

1. Use your calculator to find the value of the following:

   a. Log 10 = _____
   b. Log 100 = _____
   c. Log 1000 = _____
   d. Log 10000= _____
   e. Log 0.1 = _____
   f. Log 0.01 = _____
   g. Log 0.001 = _____
   h. Log 0.0001 = _____
   i. Log 0.00001 = _____
   j. Log (0) = _____
   k. Log (-10) = _____
   l. Log (-100)= _____

2. Without your calculator, find the values of the following:

   a. Log 10^1 = _____
   b. Log 10^2 = _____
   c. Log 10^3 = _____
   d. Log 10^4 = _____
   e. Log 10^{17} = _____
   f. Log 10^{25} = _____
   g. Log 10^{36} = _____
   h. Log 10^{-32} = _____

3. Solve the following. Show all work:

   a. $3(10^x) - 6 = 294$ x = _____
   b. $5000(10^x) = 5$ x = _____
   c. $3.412\ (10^x) = 17$ x = _____

"Fun" fact...$\log_a b = c$ is equivalent to $a^c = b$.

4. Use the above "fun" fact to change from exponential format to logarithmic format.

   a. $5^3 = 125$ _____
   b. $4^5 = 1024$ _____
   c. $3^7 = 2187$ _____

5. Change from logarithmic format to exponential format.

   a. $\log_4 1024 = 5$ _____
   b. $\log_2 \frac{1}{4} = -2$ _____
   c. $\log_6 1296 = 4$ _____

6. Solve each equation. Round answers to four decimal places. Show all work algebraically! Use separate paper, if needed.

a. $4^{3x} = 12$ _____

b. $6^{x+2} = 18$ _____

c. $5^{3x-2} = 120$ _____

d. $2.4^{x+4} = 30$ _____

e. $9^{3x} = 4^{5x+2}$ _____

f. $2^{x+5} = 3^{x-2}$ _____