Name: _____ Date: _____

INTRODUCTION TO LOGARITHMS
COMMON CORE ALGEBRA II HOMEWORK

FLUENCY

1. Which of the following is equivalent to $y = \log_7 x$?

   (1) $y = x^7$ (3) $x = 7^y$

   (2) $x = y^7$ (4) $y = x^{1/7}$

   _____

2. If the graph of $y = 6^x$ is reflected across the line $y = x$ then the resulting curve has an equation of

   (1) $y = -6^x$ (3) $x = \log_6 y$

   (2) $y = \log_6 x$ (4) $x = y^6$

   _____

3. The value of $\log_5 167$ is closest to which of the following? Hint – guess and check the answers.

   (1) 2.67 (3) 4.58

   (2) 1.98 (4) 3.18

   _____

4. Which of the following represents the *y*-intercept of the function $y = \log(x + 1000) - 8$?

   (1) -8 (3) 3

   (2) -5 (4) 5

   _____

5. Determine the value for each of the following logarithms. (Easy)

   (a) $\log_2 32$ (b) $\log_7 49$ (c) $\log_3 6561$ (d) $\log_4 1024$

6. Determine the value for each of the following logarithms. (Medium)

   (a) $\log_2\left(\frac{1}{64}\right)$ (b) $\log_3(1)$ (c) $\log_5\left(\frac{1}{25}\right)$ (d) $\log_7\left(\frac{1}{343}\right)$

7. Determine the value for each of the following logarithms. Each of these will have non-integer, fractional answers. (Difficult)

   (a) $\log_4 2$ (b) $\log_4 8$ (c) $\log_5 \sqrt[3]{5}$ (d) $\log_2 \sqrt[5]{4}$

8. Between what two consecutive integers must the value of $\log_4 7342$ lie? Justify your answer.

9. Between what two consecutive integers must the value of $\log_5\left(1/500\right)$ lie? Justify your answer.

APPLICATIONS

10. In chemistry, the pH of a solution is defined by the equation $\text{pH} = -\log(H)$ where H represents the concentration of hydrogen ions in the solution. Any solution with a pH less than 7 is considered acidic and any solution with a pH greater than 7 is considered basic. Fill in the table below. Round your pH's to the nearest *tenth* of a unit.

Substance	Concentration of Hydrogen	pH	Basic or Acidic?
Milk	1.6×10^{-7}		
Coffee	1.3×10^{-5}		
Bleach	2.5×10^{-13}		
Lemon Juice	7.9×10^{-2}		
Rain	1.6×10^{-6}		

REASONING

11. Can the value of $\log_2(-4)$ be found? What about the value of $\log_2 0$? Why or why not? What does this tell you about the domain of $\log_b x$?