

# Pre-Calculus

## Test 3

Mr. Klar

Use the 3 famous points to write a short table of values for the function. Then sketch a graph of the function. Identify any asymptotes and intercepts. (Hint: Choose values of  $x$  so that the entire exponent becomes a famous point.)

1.  $f(x) = -2^{x+3}$

2.  $f(x) = 1 + e^{2x}$

Evaluate the expression without a calculator.

3.  $\log_{1.23} 1.23^{456}$

4.  $2 \ln e^{3.14}$

5.  $5 - \log_{10}(1000)$

Use the 3 famous points to sketch the parent function. Then use transformations to sketch the given function. (You can erase the parent function once you're done with it if you want.)

6.  $f(x) = -\ln(x) + 2$

7.  $f(x) = 1 + 2\log_3(x + 3)$

Rewrite the log with base 10 by using change-of-base formula.

8.  $\log_{17} 92$

Use the properties of logarithms to expand the expression as a sum or difference of logs with no exponents or radicals.

9.  $\log_3 2b^4$

10.  $\ln \frac{x\sqrt{x+1}}{3e^4}$

Condense the expression to a single logarithm.

11.  $3\log_3 x + 4\log_3 y^2$

12.  $\ln 3x - \ln(x - 3) + \ln(x^2 - 9)$

Solve for  $x$ . Use the fact that  $\log_5(2) \approx 0.43$ . (Hint: Factor large numbers to simplify logs. You can use my "lame calculator" for the decimal arithmetic.)

13.  $3^x = 81$

14.  $5^{2x} = 250$

15.  $\log_6 x = 3$

16.  $\log_{10}(x + 3) = 4$

Solve the equation algebraically. Write your answer in terms of logs with no exponents or radicals.

17.  $\frac{1025}{8 + e^{4x}} = 5$

18.  $-xe^{-x} + e^{-x} = 0$  (Hint: use the Zero Product Property)

Bonus.  $\log_{10}(x) - \log_{10}(8 - 5x) = 2$