Homework 11

(due April 3)

Math 130 *Kovitz* 2018

True or False:

1. The term logarithm is used to refer to a function.
2. There is a closed-form algebraic formula that you can plug any positive number into to get its logarithm.
3. The output to a logarithm is an exponent.
4. You can't take the logarithm of a negative number.
5. The logarithm function is defined as the inverse of the corresponding exponential function.
6. The inverse of the logarithm function is the corresponding exponential function.
7. A logarithm can never be negative.
8. If two common logarithms are equal, the numbers (inputs) must be equal.
9. A logarithm function never yields a negative result.
10. You cannot take the log to a base less than 1.
11. Every logarithm function is decreasing.
12. All simple logarithm functions of the form $y = \log_a x$ have the same x-intercept.
13. All logarithm functions have an asymptote, which happens to be a vertical line.
14. Taking the logarithm of the base always yields 1, and the logarithm of 1 is always 0.
15. For any real number, if you take the exponent function of that number, then take the log of that result (to the same base), you get the number back as the final result.
16. The graph of $\log_{1/a}$ is always the reflection across the y-axis of the graph of $\log_a$ because the graph of a^x is always the reflection across the y-axis of the graph of $(1/a)^x$.
17. The graph of $\log_a$ has the same shape as the graph of the corresponding exponent function; they are reflections of each other across the line $y = x$.
18. The graph of a logarithm function has no symmetries.
19. Assume that the base a is greater than 1.
    (a) If the log base a of a number c is positive but less than 1, the number c must be less than 1.
    (b) If the log base a of a number c is positive but less than 1, the number c must be greater than 1 and less than a.
    (c) If the log base a of a number c is greater than 1, the number c must be greater than a.
    (d) If the log base a of a number q is negative, the number q must be positive and less than 1.
20. If $p > q$ and $a > 1$, then $\log_a p > \log_a q$.
21. With the appropriate substitutions in the equation, the graph of $y = \log_a x$ could be translated.