

Math 115 Carter Sample Test 2 Spring 2004

1. (2.5 points each) Compute the following (Hint: using a calculator will slow you down):

(a) $\log_7(343)$

(b) $\log_{1/2}\left(\frac{1}{512}\right)$

(c) $\log_5(625)$

(d) $\log_4(2)$

2. (2.5 points each) Use the rules of logarithms and exponentials to simplify the expressions.

(a) $2\log_6(x) + \log_6(x-1) - 3\log_6(x+4)$

(b) $12^{2x+2}12^{-4-2x}$

(c) $3334^{\log_{3334}(x+5)}$

(d) $\log_{56757}(56757^{42})$

3. (2.5 points each) Given that $\log_A(2) = 0.4307$, $\log_A(3) = 0.6826$, $\log_A(7) = 1.2091$, and $\log_A(13) = 1.5937$, compute

(a) $\log_A(52)$

(b) $\log_A(2/9)$

(c) $\log_A(364)$

(d) $\log_A(49)$

4. (10 points each) Sketch the graph of $f(x)$.

(a) $f(x) = \frac{x}{x^2-625}$

(b) $f(x) = \frac{x-1}{x-4}$

(c) $f(x) = (x-4)(x+2)(x+1)^2$

(d) $f(x) = 12^{2x-5}$

(e) $f(x) = 4\ln(x+1)$

5. (5 points) Compute the difference quotient $\frac{f(3+h)-f(3)}{h}$ for the function $f(x) = 2^x$.

6. (5 points) In the analogy between addition and multiplication, the analogous statement to “multiplication distributes over addition” is “exponentiation distributes over multiplication.” Given that the former law of arithmetic can be expressed in the equation, $(a + b)c = ac + bc$, express the latter law as an equation.
7. (10 points) The half-life of Unobtainium 724 is 6 days. The subversive organization “Bombs-R-us” has 12 barrels of Uno 724. How long will it take until 94% of the substance has decayed? How much will remain 32 days later?