

Math 115 Carter Sample Test 2 Fall 2004

1. Solve the following inequalities:

(a) $9 \leq |4x - 5|$

(b) $\frac{(x+3)(1-2x)}{x^2-4} \geq 0$

(c) $|10x - 3| < 17$

(d) $3x^2 - 24x - 10 < 0$

(e) $0 < x^2 - 3x - 4$

2. Sketch the graph of the following functions:

(a) $y = 30x^2 - 240x - 107$

(b) $y = -0.03x^2 + 75x - 4$

(c) $y = \frac{x-1}{x+2}$

(d) $y = \frac{x^2}{x^2-2500}$

(e) $y = (x - 2)(x + 30)(x - 20)^2(x + 40)$

(f) $y = 2^x + 4$

(g) $y = 2^{x+4}$

(h) $y = 4^x - 3$

(i) $y = 4^{2-3x}$

3. Suppose that $f(x) = \sqrt{x} - 4$ and $g(x) = x^3$. Write the function $y = x^{3/2} - 4$ as a composition of f and g .

4. Compute the following (Hint: using a calculator will slow you down):

(a) $\log_6(216)$

(b) $\log_2\left(\frac{1}{2096}\right)$

(c) $\log_{1/3}(729)$

(d) $\log_{343}(7)$

5. Given that $(x - 1)$ is a factor of $y = 2x^3 - x^2 - 7x + 6$ factor this expression completely.

6. Determine the inverse function to the expression $f(x) = \sqrt{x} - 4$.

7. Solve for x in the equation $y = \frac{x-2}{x+3}$.

Use the rules of logarithms and exponentials to simplify the expressions.

(a) $\log_{12}(x) - \log_{12}(2x - 1) + 3\log_{12}(x - 4)$

(b) $15^{3x+2}15^{1-3x}$

(c) $367^{\log_{367}(453x-4)}$

(d) $\ln(e^{42})$

8. Given that $\log_A(2) = 0.3869$, $\log_A(3) = 0.6131$, $\log_A(7) = 1.0860$, and $\log_A(10) = 1.2851$, compute

(a) $\log_A(12)$

(b) $\log_A(2/3)$

(c) $\log_A(72)$

(d) $\log_A(49)$

(e) $\log_A(28)$