

Math 115 Carter Test 2 Fall 2004

General Instructions. Write your name on ONLY the outside of your blue book. When you finish your exam put this sheet inside your blue book and hand it in to either Sam Napier or to Dr. Carter. Do not write on this sheet! Give complete solutions to the following problems. Write neatly and indicate your answers clearly.

1. Solve the following inequalities (*10 points each*):

(a) $|4x - 5| < 9$

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

(c) $x^2 + 4x - 5 < 0$

2. Sketch the graph of the following functions (*10 points each*):

(a) $y = 40x^2 + 160x - 13$

(b) $y = \frac{x}{x^2-1600}$

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

(d) $y = 3^x - 40$

3. (*5 points*) Suppose that $f(x) = \log_2(x) + 5$ and $g(x) = x^2 + 1$. Write the function $y = \log_2(x^2 + 1) + 5$ as a composition of f and g . Which function is on the inside?

4. Compute the following (Hint: using a calculator will slow you down) (*5 points each*):

(a) $\log_3(729)$

(b) $\log_2\left(\frac{1}{512}\right)$

5. (*10 points*) Given that $(2x-3)$ is a factor of $y = 2x^3 - 3x^2 - 4x + 6$ factor this expression completely over the real numbers.

6. (*5 points*) Given that $\log_A(5) = 0.609853$, $\log_A(2) = 0.26265$, $\log_A(3) = 0.41629$, compute $\log_A(30)$.