

Math 115 Carter Test 1 Spring 2004

Do not write on this test. Do not write your name on the inside of your blue books. Do all your work on the inside of your blue books. Write neat complete solutions to each of the problems below. Indicate your answers clearly, and in case there is a difference between your scratch work and your written solution, call my attention to the written solution. Do not erase scratch work unless you are certain that it is wrong. Good luck.

1. Solve the inequalities (*5 points each*):

(a) $0 \leq x - 4$

(b) $10 < |4x - 6|$

2. Determine the domains of the following functions (*5 points each*):

(a) $f(x) = \sqrt{x - 4}$

(b) $f(x) = \frac{x-7}{x-5}$

3. Compute the difference quotient $\frac{f(x+h)-f(x)}{h}$ for the function $f(x) = \frac{1}{x+1}$. (*10 points*)

4. Compute $f(g(x))$ and $g(f(x))$ for the function $y = f(x)$ and $y = g(x)$ that appears below. BE SURE TO LET ME KNOW WHICH IS WHICH! (*5 points each*)

(a) $f(x) = x^2$; $g(x) = 3x + 2$

(b) $f(x) = \sqrt{x}$; $g(x) = x - 4$

(c) $f(x) = \frac{1}{x}$; $g(x) = x + 3$

5. Sketch the graph of each of the following functions (*5 points each*):

(a) $f(x) = 3x^2 + 2$

(b) $f(x) = 2x^2 + 50x - 12$

(c) $f(x) = 3|x + 5| - 27$

(d) $f(x) = \frac{1}{x} - 2$

6. Determine the equations and sketch the graphs of the following lines (*5 points each*):

(a) The line that passes through the point $(0, -9)$ and that has slope 3.

(b) The line whose x -intercept is $(-180, 0)$ and whose y -intercept is $(0, 120)$.

(c) The line that passes through the point $(6, 5)$ and that is parallel to the line $y = 5x - 4$.

7. Determine the maximum value for the product $A = xy$ when $3x + y = 500$.

8. Rent-a-cars from Al Emons Car Rentals cost \$25 per day plus \$0.35 per mile. Meanwhile, cars from Bran Dex Car Rentals cost \$30 per day plus \$0.20 per mile. Textbook Salesperson Gose Eltecs is flying to Pensacola to visit the University of West Florida in the morning, driving to Mobile to visit the University of South Alabama, and returning to Pensacola that evening. According to MapQuest the distance between the Universities is 66 miles. Which car should she rent and why?