Spring 2012 Math 151

Week in Review # 7
sections: 4.2, 4.3, 4.4
courtesy: Joe Kahlig

Section 4.2

1. Determine if the function is one-to-one.
   \[ y = \sqrt[3]{x^2 + 1} \]

2. Show that the function is one-to-one and find the inverse.
   \( f(x) = \frac{1 - 4x}{3x + 5} \)
   \( f(x) = \sqrt[3]{x^3 + 7} \)

3. Assume that the function \( f \) is a one-to-one function with inverse \( g \). Compute a formula for \( g'(x) \) based on \( f \).

4. If \( g \) is the inverse of the function \( f \), compute \( g'(2) \).
   \( f(x) = x^5 - x^3 + 2x \)

5. If \( g \) is the inverse of the function \( f \), compute \( g'(6) \).
   \( f(x) = 5 + xe^{(x^2-2x+1)} \)

Section 4.3

6. Evaluate: \( 4^{2\log_4 9} \)

7. Find the domain of this function.
   \[ y = \ln(x^2 - 9) \]

8. Use the fact that \( \log_a 2 = 0.38 \), \( \log_a 3 = 0.63 \), and \( \log_a 5 = 0.88 \) to compute these logarithms.
   \( \log_a 20 \)
   \( \log_a \left( \frac{81}{a^5} \right) \)

9. Solve for \( x \).
   \( 4e^{(3x+2)} = 12 \)
   \( 5(7)^{4x} = 3 \)
   \( \log(x - 2) + \log(x + 4) = \log 7 \)
   \( \log_5(6x - 5) = 2 \)
   \( \log_{27}(4\log_2(5x - 4) - 17) = \frac{1}{3} \)
Section 4.4

For problem 10-16, find the derivatives of these functions.

10. \( y = \log_5(7 - 4x) + 3^{\sec(x)} \)

11. \( y = (\ln(x^4 + 5x))^4 \)

12. \( y = \ln(\ln(3x + 1)) \)

13. \( y = 7x^2 \log(x^4 + 1) \)

14. \( y = \ln\sqrt{\frac{x^2 + 5}{5x - 8}} \)

15. \( y = (x^2 + 3)^{\cos(2x)} \)

16. \( y = \frac{(2x^6 + 4)^5}{(7x^2 + 5)^3} \)