Spring 2015 Math 151

Week in Review 7

courtesy: Amy Austin

(Covering 4.3-4.4)

Section 4.3

1. Evaluate $\log_3 108 - \log_3 4$
2. Evaluate $\log_2 6 - \log_2 15 + \log_2 20$
3. Find the value of $\ln \sqrt{e^3}$
4. Find the value of $e^{-2\ln 5}$
5. Express $\log_8 x - \log_8 \sqrt{9x+2} + 5\log_8(x+1)$ as a single logarithm.
6. Solve for x: $\log(x+3) + \log(x) = 1$
7. Solve for x: $y = \ln(7x - 9)$
8. Solve for x: $\ln x - \ln(x+1) = \ln 2 + \ln 3$
9. Find the inverse of $f(x) = e^{6x-3}$
10. Find $\lim_{x\to\infty}[\log(2x-1) - \log(3x+6)]$
11. Find $\lim_{x\to 3^+} \ln(x^2 - 9)$
12. Find $\lim_{x\to 0} \ln(\cos x)$
13. What is the domain of $f(x) = \ln(4 - x^2)$?
14. What is the domain of $f(x) = \ln x + \ln(3 - x)$?

Section 4.4

15. Differentiate each function:
    a.) $f(t) = \cos^2 t(\ln t)$
    b.) $f(x) = \ln(\sin 2x)$
    c.) $f(x) = \log_5(e^{10x})$
    d.) $f(x) = 3^{\tan(7x)}$
16. Using logarithmic differentiation, find the derivative of
    a.) $y = x^{\sin x}$
    b.) $f(x) = \dfrac{e^{-x}\sin^2 x}{x^2 + x + 1}$
17. Find the equation of the tangent line to the graph of $f(x) = x\ln x$ at $x = e^2$.
18. What is the slope of the parametric curve $x = t\ln t$, $y = 2^{3t}$ at the point $(0, 8)$?