## Math 130 Day 22

Office Hours (LN 301/301.5): M 3:30-4:30, Tu 11:00-1:00, W 12:15-1:15, F 1:30-2:30. Other times by appointment. Math Intern: Sun through Thurs: 3:00-6:00, 7:00-10:00pm. Website: Use the links at the course homepage on Canvas or go to my course Webpage: http://math.hws.edu/~mitchell/Math130F16/index.html.

## Practice

1. Read/Re-read Chapter 3.9 on Derivatives of Logs and Exponentials. Review the online notes (they are now back). We will finish this next time and also review Implicit Differentiation. (So review Chapter 3.8)
2. a) Page $199 \# 3,9,11,15$ (simplify first with a $\log$ rule), 17,19 (a classic).
b) Assuming we get this far: Page $199 \# 17$ and 19 .
3. More implicit differentiation problems. The answers are below. For each relation, find $\frac{d y}{d x}$.
a) $3 y+\ln y=x^{2}-x$
b) $\ln (x+y)=2 x$
c) Find the tangent line to the curve in (a) at the point $(2,1)$

Answers
a) $\frac{d y}{d x}=\frac{2 x-1}{3+\frac{1}{y}}=\frac{2 x y-y}{3 y+1}$
b) $\frac{d y}{d x}=2 x+2 y-1$
c) $y=\frac{2}{7} x+\frac{3}{7}$

## Hand In at Lab: Name:

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0. Do WeBWorK Set Day22. Due Sunday. The first 5 problems are hand in problems. Check your answers!

1. Determine $\frac{d y}{d x}$ if $\sin \left(x^{2} y^{2}\right)=2 x-1$. WeBWorK $\# 1$.
2. Determine the derivative of $f(x)=\ln \left|x^{2} \sin x\right|$. Hint: Simplify using a log law before differentiating. WeBWorK \#2
3. Find the derivative of $g(x)=\ln \sqrt{x^{4}+9 x^{2}+6}$. Hint: Simplify using a log law before differentiating.
4. Find the derivative of $g(x)=6 x^{5} \cdot 5^{x}$. WeBWorK \#3
5. Find the derivative of $g(x)=2^{\sin \left(3 x^{2}\right)}$. WeBWorK \#4
6. Use logarithmic differentiation to determine the derivative of $y=\left(x^{2}+1\right)^{4 x^{3}}$. WeBWorK \#5
