Discussion Problems for Math 180

Thursday, February 5, 2015

Review

1. Write as a single logarithm: $2\ln x - \ln y + 1$
2. Simplify $\dfrac{4e \cdot e^{x^2}}{e^{2x}}$

This time

3. (a) Find the derivative of $\dfrac{1}{x^2}$ using the definition.
   (b) Find the same derivative using the quotient rule. Do your answers agree?
4. Which functions $f(x)$, if any, have $\dfrac{df}{dx} = 3x^2$?
5. Differentiate $\dfrac{x}{x^2-1}$.
6. Differentiate $x^3\sin(x) - x^2\cos(x)$.
7. Differentiate $\dfrac{\sin^2(x)}{\pi}$.
8. Write an equation for the tangent line to the curve $y = \sin^3(x)$ at the point $\left(\dfrac{\pi}{6}, \dfrac{1}{8}\right)$.
9. Given that $\dfrac{d}{dx}e^{kx} = ke^{kx}$ for any number k, what is $\dfrac{d}{dx}4^{x-1}$?