Review Problems

October 7, 2016

1. (Fall 2002, Exam 2, #3) Differentiate $y = (\ln x)(\tan^{-1}(x))$.
2. Differentiate and simplify your answer:
   (a) $y = \ln \sqrt{x^2 + 2x}$
   (b) $y = x^{\ln x}$
3. (Fall 2005, Exam 2, #9) Evaluate $\frac{d}{dx}(x^{\cos x})$.
4. (Fall 2005, Exam 2, #11) Given $f(x) = \dfrac{\ln x}{x^2}$, find $f''(x)$.
5. (Fall 2007, Exam 2, #7) If $g(x) = \log_3(x^4)$, find $g'(x)$.
6. (Fall 2007, Exam 2, #9) What is the derivative of $x^{\cos x}$ at $x = \pi/2$?
7. (Fall 2008, Exam 2, #9) Find an equation for the line tangent to the graph of $y = \dfrac{x^3}{\ln x}$ at the point (e, e^3).
8. (Fall 2008, Exam 2, #11) Let $y = x^{\tan x}$. Find $\dfrac{dy}{dx}$.