Discussion Problems for Math 180

Tuesday, February 24, 2015

Review

1. Calculate logarithms:

    (a) $\log_5(125)$

    (b) $\log_2\left(\dfrac{1}{8}\right)$

    (c) $\log_3\sqrt{3}$

2. Calculate inverse trig functions:

    (a) $\sin^{-1}\left(\dfrac{1}{2}\right)$

    (b) $\cos^{-1}\left(\dfrac{1}{2}\right)$

    (c) $\tan^{-1}(1)$

3. Complete the square: $x^2 + 4x + 8$.

4. What is the derivative of $f(x) = \ln\cos x$?

5. What is the derivative of $f(x) = \dfrac{\sqrt{x}}{x^2+1}$?

This time

6. Consider the function $f(x) = x^x$, with domain $(0, \infty)$. For which x, if any, is $f'(x) = 0$?

7. Prove that
$$\frac{d}{dx}\sin^{-1}(x) = \frac{1}{\sqrt{1-x^2}}$$
using implicit differentiation and trigonometry. Do this off the top of your head, without consulting your notes or any other references.

8. Which function(s) $f(x)$, if any, have
$$f'(x) = \frac{1}{x^2+4x+8}?$$
(This will require some creativity.)