Math 120 Homework 8

- Due Friday Nov 17 at start of class.
- If your homework is longer than one page, **staple** the pages together, and put your name on each sheet of paper. **Homework that is not stapled will loose 1 point.**
- Each homework problem should be correct as stated. Occasionally, however, I might screw something up and give you an impossible homework problem. If you believe a problem is incorrect, please email me. If you are right, the first person to point out an error will get +1 on that homework, and I will post an updated version.

Hyperbolic and inverse trigometric functions

1. Compute the derivative of $f(x) = \frac{\arccos x}{x^2-1}$. What is the domain of $f(x)$?

2. Prove that $\sinh(x+y) = \sinh(x)\cosh(y) + \cosh(x)\sinh(y)$ and $\cosh(x+y) = \cosh(x)\cosh(y) + \sinh(x)\sinh(y)$.

3. Graph the function $f(x) = \arctan(\tan(x))$ for all x in $D(f) \cap [-2\pi, 2\pi]$. You do not need to prove that your graph is correct, but draw it carefully—mark your x and y axes, scale things properly, and be sure to get the domain correct.

Implicit differentiation

4. At which points on the ellipse $x^2 + 3y^2 = 1$ is the tangent line parallel to the line $y = x$? Prove that your answer is correct.

5. Compute the slope of the tangent line of the curve $y^5 + 2xy^3 + 3x^2y + 10x = 16$ at the point $(1, 1)$.