Math 732 Assignment #1
Due: Wednesday, January 23, 2013

Submit full answers to the Required Problems. Remember to use complete sentences and proper grammar when writing a solution. Include sketches wherever appropriate.

Required Problems

G&P section 1.1: 4, 12, 18

For 12 on *stereographic projection*, you should derive the following formulas. If (x, y, z) is a point on the sphere, show that

$$\pi(x, y, z) = \left(\frac{x}{1-z}, \frac{y}{1-z} \right).$$

Show that the inverse map π^{-1} applied to a point (u, v) in the plane satisfies

$$\pi^{-1}(u, v) = \left(\frac{2u}{u^2+v^2+1}, \frac{2v}{u^2+v^2+1}, \frac{u^2+v^2-1}{u^2+v^2+1} \right).$$

n.b., there are typos in problems 4 and 18. In 4, the ball $B_a = \{x : |x| < a\}$. In 18, the function $g(x) = f(x-a)f(b-x)$.

Additional Problems – you may submit these for feedback; if you do, please indicate on the top of your first page. We will discuss these in the problem session.

G&P section 1.1: 3, 8, 9, 11