You may use any books, notes, tables, or calculators you wish. Be sure and write your answers so that someone other than yourself can understand your exposition. Give exact answers—do not give decimal or other approximations. If you give an approximation, you will receive an F in this course, and I shall exert every effort to have you expelled from Georgia Tech. *Fortuna vobiscum*.

- **1. a)** Find all z such that 2iz 3z + 2 7i = 3 + 5i (Find in rectangular form; that is, find real numbers a and b such that z = a + i b.)
 - **b**) Sketch the set of all z such that |z-1+i|-|z+2-5i|=0.
- **2.** Let $f(z) = x^3 + iy^2$.
 - a) Sketch the set of all points at which f has a derivative.
 - **b**)Sketch the set of points at which f is analytic.
- 3. **a)**Find Log (-1-i). **b)**Find Log $(-1-i)^2$. **c)**Does Log $(-1-i)^2 = 2$ Log (-1-i)?
- **4.** Find all values of i^i . What is the principal value of i^i ?