Mathematics 113. Complex Analysis, Spring 2008

Homework 1, I typed this out since many of you don't have the book yet.

Instructor: Robert Strain

- Section 1.1, problem 16. Prove that, for each integer k,

  $$i^{4k} = 1,\ i^{4k+1} = i,\ i^{4k+2} = -1,\ i^{4k+3} = -i.$$

  Show how this result gives a formula for i^n for all n by writing $n = 4k+j$, $0 \leq j \leq 3$.

- Section 1.1, problem 17. Simplify the following

  (a) $(1+i)^4$

  (b) $(-i)^{-1}$

- Section 1.2, problem 18. Prove the following

  (a) $\arg \bar{z} = -\arg z \mod 2\pi$

  (c) $\arg(z/w) = \arg z - \arg w \mod 2\pi$

  (b) $|z| = 0$ if and only if $z = 0$