Assignment 3
Math 605, Fall '00

Read sections 3.1, 3.5, 3.2, 3.3, 3.4 (I'll cover things in class in that order) from Greene and Krantz.

Solve the following problems.

1. From the textbook. Pages 62-70: 26, 36

2. (From Ahlfors) Compute (integrating in the counterclockwise direction)

$$\int_{|z|=1} |z-1|\,|dz|.$$

3. (Also from Ahlfors) Given $a \in \mathbf{C}$, $R \in \mathbf{R}$ and an analytic polynomial $P(z)$, show that

$$\int_{|z-a|=R} \overline{P(z)}\,dz = 2\pi i R^2 \overline{P'(a)}.$$

4. (And again, from Ahlfors) Given $a, b > 0$, let γ parametrize the line segment from 0 to $a+bi$. Show that

$$\left| \int_\gamma \cos(z^2)\,dz \right| \leq \frac{\sqrt{a^2+b^2}}{2ab} \sinh(2ab).$$