



COMPLEX VARIABLES
FALL 2024

ASSIGNMENT 11.1
DUE NOVEMBER 20

Exercise 1. Given an open disk $D(z_0; r)$ with $z_0 \in \mathbb{C}$ and $r > 0$, and $z \in D(z_0; r)$, recall that we defined γ_z to be the unique L-shaped path in $D(z_0; r)$ from z_0 to z consisting of a horizontal segment followed by a vertical segment (or just one or the other if z happens to lie on either the horizontal or vertical diameter of $D(z_0; r)$). If f is analytic on $D(z_0; r)$, we then defined

$$F(z) = \int_{\gamma_z} f(w) dw.$$

- a. Complete the proof that $F_x = f$ on $D(z_0; r)$.
- b. Show that $F_y = if$ using a similar argument (this *does not* require Cauchy's Theorem for a Rectangle).

Exercise 2. Textbook exercise 2.3.7.

Exercise 3. Textbook exercise 2.3.8.

Exercise 4. Textbook exercise 2.3.10.