

# Homework 8

Due Tuesday, April 4 at 10pm. Please upload a legible pdf to Gradescope.

You may work together, but the solutions must be written up in your own words.

§# refer to Brown and Churchill, Ninth Edition

**Hand in:**

§65 #10, 11

§68 #1, 4, 5

§72 #1, 4, 6

§77 #1

Additional #1 Let  $z_1, \dots, z_n$  be a finite set of complex numbers, and  $z_0$  a complex number not in that set. Prove that the radius of convergence of the Taylor series for

$$\frac{1}{(z - z_1) \dots (z - z_n)}$$

centered at  $z_0$  is

$$R = \min\{|z_0 - z_1|, \dots, |z_0 - z_n|\}.$$

Hint: do not compute the coefficients of any series.

Additional #2 Let  $f$  be analytic on  $|z - z_0| < R$ . Find the residue at  $z_0$  of  $\frac{f(z)}{z - z_0}$ .

**Recommended, but don't hand in:**

§68 #2, 10

§72 #2, 7, 8

§65 #1, 4, 7