

# Complex Analysis 1, MATH 5510, Spring 2022

## Homework 11, Section IV.2

Due Saturday, April 16

**Write in complete sentences!!!** *Explain* what you are doing and convince me that you understand what you are doing and why. Justify all steps by quoting relevant results from the textbook or hypotheses.

**IV.2.6.** Give the power series for  $f(z) = \sqrt{z}$  about  $a = 1$  and find its radius of convergence.

**IV.2.9(a).** Evaluate  $\int_{\gamma} \frac{e^z - e^{-z}}{z^n} dz$  where  $n \in \mathbb{N}$  and  $\gamma(t) = e^{it}$  for  $t \in [0, 2\pi]$ .

**IV.2.9(b).** Evaluate  $\int_{\gamma} \frac{dz}{(z - 1/2)^n}$  where  $n \in \mathbb{N}$  and  $\gamma(t) = \frac{1}{2} + e^{it}$  for  $t \in [0, 2\pi]$ .