Homework 8. Due Nov. 12

197/3,6,8,11 (Don’t use problem 10. Just use Taylor series as in class. If you insist on using 10 you are required to prove that result.)

208/3,6,8,9

9. Consider the function

\[ f(z) = \frac{\sin z}{2 + e^{i\pi}} \]

which is \(2\pi\) periodic and analytic in a neighborhood of the real axis. The largest such strip was computed in Problem 9 of Assignment 7.

a. Find the function \(g(z)\) which is analytic in a neighborhood of \(\{z : |z| = 1\}\) and satisfies \(f(z) = g(e^{iz})\).

b. Find the Laurent expansion of \(g\) with center at \(z = 0\).

c. Use b. to give the Fourier series expansion of \(f\).