

Math 7350 @ LSU
Stephen Shipman
Midterm Exam Preparation
Fall, 2013

Think about these problems as preparation for the midterm exam.

1. Let $P(z)$ and $Q(z)$ be polynomials.

a. On which (not necessarily simply connected) domains in the complex plane does the expression

$$\left(\frac{P(z)}{Q(z)}\right)^{1/n} \quad (n \in \mathbb{N})$$

define a single-valued analytic function?

b. How can one compute appropriate integrals of the form

$$\int_a^b \left(\frac{P(x)}{Q(x)}\right)^{1/n} dx, \quad (1)$$

in which the coefficients of P and Q are real?

2. Think about the inverse Fourier transform of the function

$$\hat{f}(\omega) = \frac{1}{\omega^2 + 2ib\omega - 1} \quad (2)$$

and what people could do with it.

3. Practice problems like Exercises 8–10 (p. 155) of Chapter 5 of our text book.