

Review For 515 Test 1

Definitions of the words in **boldface** may be asked on the exam.

Chapter 1

Definitions: absolute value(norm), conjugate, polar form, n^{th} roots of unity, Euler's formula

Proofs: Trig identities (22), Reverse triangle inequality 7(c)

Sample problems: 13,16,37,131

Chapter 2

Definitions: multiple-valued functions, $\exp(z)$, $\ln(z)$, $\cos(z)$, $\sin(z)$, limits, continuity, branch lines, sequences, infinite series

Sample problems: 4, 8,13,16, 30, find real imaginary parts of functions above

Chapter 3

Definitions: derivative, analytic, Cauchy-Riemann equations, harmonic functions, harmonic conjugates singular points, orthogonal families

Proofs: Cauchy Riemann equations(3.5).

If $f = u + iv$ is analytic show that u, v are harmonic if they have continuous second partial derivatives. (3.6)

Orthogonal families. (3.27)

Sample problems: 1,2,4,7,11, be able to verify C-R in polar form

Chapter 4

Definitions: complex line integral, indefinite integral simply and multiply connected regions, Cauchy's Theorem, Morera's Theorem, Theorem 4.1-4.5 pg 117

Proofs: Cauchy's Theorem (4.11)

Sample problems: 2,17,21,22,23,27,43