

Math 316
Complex Variables

Homework I

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1.1

To prove that a function is holomorphic we keep in mind that products and sums, products and quotients of holomorphic functions are construct holomorphic functions (provided that there is no division by zero)

a)

$$f(z) = \sin(z) - \frac{z^2}{z+1}$$

$\sin(z)$ is a trigonometric function so it is holomorphic, z^2 and $z+1$ are both polynomials and so are holomorphic, therefore their quotient is holomorphic therefore the sum of the two parts is holomorphic when $z \neq -1$

c)

$$h(z) = \frac{\cos(z)}{z^2+1}$$

$\cos(z)$ is a trigonometric function so it is holomorphic, z^2+1 is a polynomial is z so it is holomorphic. Their quotient is therefore holomorphic when $z \neq i, -i$

1.2

$$z =$$

2 dump