Math 4213 - Complex Analysis

Quiz #20 - 2012.03.30

Solutions

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1. What makes a mapping $w = f(z)$ conformal?

   A mapping $w = f(z)$ is conformal if it preserves angles between oriented curves.

2. State which contour to use to compute the following integral:

$$\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)^2}\,dx$$

The integrand is a rational function with no zeros on the x-axis, and the degree of the denominator is at least two more than the degree of the numerator. Therefore, we can use contour which is the the upper $1/2$ semi-circle of radius R as $R \to \infty$.