

# Math 4213 - Complex Analysis

Quiz #2 - 2012.01.18

Solutions

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1. Give a geometric description of how the  $n$  roots of unity work for a complex number  $\omega$ .

Geometrically, the  $n$  roots of unity have modulus which is the  $n$ th root of the modulus of  $\omega$ , and the arguments break the complex circle of the modulus previously described, into  $n$  pieces, with the angle between each successive root being  $2\pi/n$ , with the first being  $\arg(z)/n$ .

2. What is a simple closed curve in the complex plane, and how does it divide up the complex plane?

A simple closed curve in the complex plane such that its starting point is equal to its ending point, but does not intersect itself anywhere. A simple closed curve divides the complex plane into three pieces – the simple closed curve, the interior of the simple closed curve, and the exterior of the simple closed curve.