

Review for quiz 1

2025-08-30

We have our first quiz in just a couple of days - on Wednesday, September 2nd. The problems on the quiz will be a subset of variations of these problems.

Problems

1. Write down the following definitions
 - a. The set $\mathbb{C}$ of complex numbers, together with addition and multiplication of complex numbers.
Your definition should be expressed in terms of real numbers and ordered pairs (which we take for granted), as described in the first paragraph of [Section 1.2](#). The definitions of addition and multiplication are stated in [Definition 1.2.1](#) and [Definition 1.2.4](#).
 - b. Euler's formula
[Formula 1.4.6](#) of our text
 - c. Domain
[Literally, this exact sentence](#)
2. Show that the addition of complex numbers is commutative.
3. Describe the image of the rectangle

$$R = \{z \in \mathbb{C} : -1 < \operatorname{Re}(z) < 1 \text{ and } 0 < \operatorname{Im}(z) < \pi\}$$

under the application of the exponential function in set theoretic notation. Draw a picture of it as well.

4. Use the exponential function to express all the roots of $f(z) = z^{10} - 1024$ in polar form.
5. Suppose I tell you that $z_1 = -1 + 2i$ is a root of

$$f(z) = z^5 + 2z^4 + 5z^3 - z^2 - 2z - 5.$$

Give me one more root and explain how you know.