Notes of Real And Complex Analysis

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December 2017

The Exponetial Function

$$exp(z) = \sum_{n=0}^{\infty} \frac{z^n}{n!} \tag{1}$$

$$exp(a)exp(b) = exp(a+b) \tag{2}$$

$e = exp(1)$, $e^z = exp(z)$, $e^0 = 1$

Theorem 0.0.1. *1.* $e^z \neq 0$

2. $exp'(z) = exp(z)$
3. *monotonically increasing positive, and* $e^x \to \infty, x \to \infty$, *and* $e^x \to 0, x \to -\infty$
4. $\exists \pi > 0 \Rightarrow e^{\pi i/2} = i$, *and* $e^z = 1 \Leftrightarrow z/(2\pi i)$ *is an integer.*
5. *periodic,* $2\pi i$
6. *The Mapping* $t \to e^{it}$ *maps the real axis onto the unit circle.*
7. *If* w *is a complex and* $w \neq 0$, *then* $w = e^z$ *for some* z.

Part I

Limit

Chapter 1

2

1.1 a

1.1.1 b

Appendix A

First Appendix

Last note