
Complex analysis

Demonstration 7

9. 11. 2004

1. Find all values of the $\log z$ if z is

$$(a) 2, \quad (b) -i, \quad (c) \sqrt{3} - i.$$

2. Find $\text{Log } z$ for each part of 1.

3. Find all values of

$$(a) 1^\pi, \quad (b) 1^{i\pi}, \quad (c) i^i.$$

4. Show that $z^0 = 1$, for $z \neq 0$.

5. Evaluate the given integrals

$$(a) \int_{|z|=1} \frac{z}{(z-2)^2} dz \quad (b) \int_{|z|=2} \frac{e^z}{z(z-3)} dz$$
$$(c) \int_{|z+1|=2} \frac{z^2}{4-z^2} dz \quad (d) \int_{|z|=1} \frac{\sin z}{z} dz.$$

6. Evaluate the integral

$$\int_0^\pi \frac{d\theta}{1 + \sin^2 \theta}.$$