

MATH 185-03: Complex Analysis

Homework #3

Due September 24, 2014

1. Exercise I.8.7
2. We define the cosine and sine functions on the entire complex plane by

$$\cos z = \frac{e^{iz} + e^{-iz}}{2}$$
$$\sin z = \frac{e^{iz} - e^{-iz}}{2i}.$$

Find the derivatives of $\cos z$ and $\sin z$.

3. Exercise II.3.3
4. Exercise II.3.8 (Use the substitutions $x = r \cos \theta$ and $y = r \sin \theta$ and the multivariable chain rule)
5. Exercise II.4.5
6. Exercise II.5.1(b)(c)
7. Exercise II.5.4