

M417

Fall 1996

hwcr.tex due September 14, 1996

1. Verify that $f(z) = \bar{z} = x - iy$ is not differentiable at any point z .
2. Verify that $f(z) = |z^2|$ is differentiable only at $z = 0$.
3. The complex exponential function e^z is defined as

$$\exp(z) = e^z = e^x (\cos(y) + i \sin(y)).$$

Verify that e^z satisfies the Cauchy–Riemann equations for all z .

4. Discuss

$$\lim_{z \rightarrow \infty} e^z.$$