MAT 514 - Summer II 2020
July 23, 2020

Long Quiz 2

Problem 1 Determine at which points the function $f(z) = \frac{1}{\bar{z}}$, defined for $z \neq 0$, is complex-differentiable.

Problem 2 Find a function $v(x, y)$ so that

$$f(x + iy) = (2x^2 + x + 1 - 2y^2) + iv(x, y)$$

safisties the Cauchy-Riemann equations.

Problem 3 Use properties of the exponential function to derive the following relation:

$$\sin(2z) = 2\sin(z)\cos(z).$$