COMPLEX VARIABLES
FALL 2024

ASSIGNMENT 5.2
DUE OCTOBER 2

Exercise 1. Let $f(z) = \frac{z \operatorname{Re}(z)}{|z|}$ for $z \neq 0$, and let $f(0) = 0$. Prove that f is continuous throughout $\mathbb{C}$.

Exercise 2. For $z \neq 0$, let $f(z) = \frac{\overline{z}}{z}$. Does $\lim_{z \to 0} f(z)$ exist?

Exercise 3. Let $f(z) = \frac{(\operatorname{Im}(z))^2}{|z|}$ for $z \neq 0$, and let $f(0) = 0$. Is $f(z)$ continuous at $z = 0$?