Math 295 - Fall 2020
Homework 1
Due at 11:59pm on Friday September 11

Please turn in this assignment on Gradescope.

Problem 1 : (Objectives A2, A3, A4) Fix a positive integer n and a complex number w. Find all solutions to $z^n = w$. (Hint: Write w in terms of polar coordinates.)

Problem 2 : (Objective A5) Suppose that p is a polynomial with real coefficients. Prove that $p(z) = 0$ if and only if $p(\bar{z}) = 0$.

Problem 3 : (Objectives A1, A5) Show that z is either real or purely imaginary if and only if $(\bar{z})^2 = z^2$.

Problem 4 : (Objective A7) Prove the reverse triangle inequality.

Problem 5 : (Objectives A5, A6) Prove that

$$z^{-1} = \frac{\bar{z}}{|z|^2}.$$