# ECE 6382

# Fall 2023

## Homework Set #1

Homework problems are from *Mathematical Methods for Physicists*, 7th Ed., by Arfken, Weber, and Harris.

**Chapter 1, Section 8, Complex Numbers and Functions**

**Prob. 1.8.1**

**Prob. 1.8.3(a)**

**Prob. 1.8.6(b)** (first part only, for |sin *z*|)

**Prob. 1.8.7(b)** (first part only, for |sinh *z*|) (Please see note 1.)

**Prob. 1.8.10**

**Prob. 1.8.11**

**Chapter 11, Section 2, Cauchy-Riemann Equations**

**Prob. 11.2.1**

**Prob. 11.2.3** (Please see note 2.)

**Prob. 11.2.7** (Please see note 3.)

**Prob. 11.2.11** (Please see note 4.)

**NOTES**

**Note 1:** Please note the misprint in part (b): .

**Note 2:** As a hint, note that if we know , we can write, where *C* is a constant. Generalizing this to a function of two variables, if we know  we can write , where is an arbitrary function of *y*. In your answers, remember to include any constants that are allowed to be there!

**Note 3:** Note that if *r* changes with *θ* fixed, and  if *θ* changes with *r* fixed. You will also need to use the product rule for derivatives to see how  varies when both *r* and *θ* change independently.

**Note 4:** Please note the misprint:  should be .