Carnegie Mellon University

Department of Electrical and Computer Engineering

18-200 **Fall 2000**

Mathematical Foundations of Electrical Engineering

Problem Set 1

Issued: Tuesday, September 5
Due: Tuesday, September 12

This set involves rectangular to polar conversions (and vice-versa), taking roots of complex numbers and raising them to powers, and taking some derivatives. It looks long, but these are some skills you'll want to get good with and be able to perform quickly. It may be a little tedious at times, but shouldn't be too difficult for you.

Do the following problems from these Problem Set sections of Kreyszig, chapter 12:

Section 12.1 p. 657

1. Problem 5
2. Problem 7
3. Problem 8
4. Problem 10
5. Problem 12
6. Problem 17

Section 12.2 p. 662

1. Problem 3
2. Problem 8
3. Problem 9
4. Problem 14
5. Problem 17
6. Problem 21
7. Problem 24
8. Problem 27

Section 12.3 p. 668

7. Problem 11

(In these next problems, just take the derivative with respect to ***z*** and plug in the point given to solve the problem. We'll see how to check functions like this for the existence of their derivatives soon, but for now, you can just take our word for it that the derivative exists.)

8. Problem 19 (derivative exists, no need to check)
9. Problem 20 (derivative exists, no need to check)
10. Problem 21 (derivative exists, no need to check)