HomeWork #1 Due Sep 13

1.2	Page 2	1a,b,e,f, 2a,d,e,f, 3, 4c, 5-6
1.3	Page 4	1, 3
1.4	Page 5	1-3, 5, 7
1.6	Page 10	2, 4, 5
2.1	Page 13	2, 7, 10e, 11
2.2	Page 17	3, 4

P. 1. Prove there does not exist an order relation $\prec$ on $\mathbb{C}$ such that $(\mathbb{C}, +, \bullet, \prec)$ is an ordered field.

HomeWork #2 Due Sep 27

2.3	Page 20	1, 3-6, 8
2.5	Page 28	1, 3-6, 10

P. 1. Find the loci of points satisfying:

a) $\mathrm{Re}\dfrac{1}{z} > \dfrac{1}{2}$

b) $|z^2 - 1| = a,\ a > 0$

P. 2. Let $M = \{x \mid 0 \le x \le 1,\ x = 0.x_1x_2x_3x_4x_5\cdots,\ x_i \text{ odd}\}$ i.e., M is the set of numbers between 0 and 1 (inclusively) with infinite decimal representations all of whose digits are odd.

Question. Is M closed?

P. 3. Suppose $\{z_n\} \to V$. Show $z_n' = \dfrac{z_1 + z_2 + \cdots + z_n}{n} \to V$.

Homework #3 Due Oct 13

3.1	Page 33	2-7
3.2	Page 43	1, 3-4, 6-12

P. 1. Let $f(z) = \exp(-1/|z|)$. Show that this function is uniformly continuous on $D = \{z : 0 < |z| < 1\}$.

P. 2. Show that $e^z > 1 + z$ for $z \in \mathbb{R},\ z \neq 0$.

P. 3. Find all solutions of:

a) $\cos 2z = 3i$
b) $\sin z = 8$

Homework #4 Due Oct 25

3.2	Page 44	14-15, 17, 19, 21
3.3	Page 54	1, 3, 5

P. 1. The domain $\{z : |z| < 1\}$ is mapped onto the upper half-plane by a bi-linear transformation which takes 1, *i*, -1 into 0, 1, ∞, respectively. Find the mapping. What are the images of the radii of the unit circle leading (from 0) to the points 1, *i*, -1, -*i*?

Homework #5 Due Nov 15

3.3	Page 54	8, 10, 13-18, 20, 22-23, 28, 30
4.1	Page 67	1, 5-7

P. 1. Let $D = B(0,1)$ and $E = B(0,1)\setminus \overline{B}(-1/2,1/2)$. Find the unique one-to-one, conformal mapping $f : D \to E$, $f(0) = ½$, $f'(0) > 0$.

P. 2. Let $D = B(0,1)$ and $E = B(0,1)\setminus(-1,-½]$. Find the unique one-to-one, conformal mapping $f : D \to E$, $f(0) = 0$, $f'(0) > 0$.

Homework #6 Due Nov 29

4.1	Page 67	8-13, 16, 19-22
4.2	Page 73	1-5, 7a,c,d, 8, 9a-d, 10-11, 13

Homework #7 Assigned

4.3	Page 80	1-2, 4, 6-10

Next Semester

4.5	Page 87	1, 3, 4, 6-9
4.6	Page 95	4-6, 8, 10-11
4.7	Page 99	2-4, 6-7

P. 1. Verify the parenthetical comment on page 98:

To show the second equality above takes a little effort, although for g smooth it is easy. The details are left to the reader.

5.1	Page 110	1a,b,c,e,h,j, 4, 6, 8, 10, 13-14, 16
5.2	Page 121	1,a,c, 2,a,b,c,d, 3-4, 6
5.3	Page 126	2, 6, 9-10