HomeWork #1   Due Sep 8

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 22

2.3	Page 20	1, 3-6, 8
2.5	Page 28	1, 3-6, 10
3.1	Page 33	2-7

P. 1.   Find the loci of points satisfying:

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

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

P. 2.   Let $M = \{x \mid 0 \le x \le 1, x = 0.x_1 x_2 x_3 x_4 x_5 \cdots, x_i \text{ odd}\}$ 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 $\{z_n\} \to \varsigma$. Show $z_n' = \dfrac{z_1 + z_2 + \cdots + z_n}{n} \to \varsigma$.

Homework #3   Due Oct 13

| 3.1 | Page 33 | 2-7 |
| 3.2 | Page 43 | 1, 3-4, 6-12, 14-15, 17, 19, 21 |

Homework #4   Due   Oct 27

    3.3   Page 54   1, 3, 5, 8, 10, 13-18, 20, 22-23, 28, 30

    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) $\sin z = 8$

    P. 4.   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?

    P. 5.   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 $f : D \to E$, $f(0) = \frac{1}{2}$, $f'(0) > 0$.

    P. 6.   Let $D = B(0,1)$ and $E = B(0,1) \setminus (-1, -\frac{1}{2}]$. Find the unique one-to-one, conformal mapping $f : D \to E, f(0) = 0, f'(0) > 0$.

Homework #5   Due Nov 17

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

Homework #6   Due Dec 1

    4.3   Page 80   1-2, 4, 6-10
    4.5   Page 87   1, 3, 4, 6-9

Homework #7   Not Assigned

4.6   Page 95   4-6, 8, 10-11
4.7   Page 99   2-4, 6-7
5.2   Page 121   1,a,c, 2,a,b,c,d, 3-4, 6
5.3   Page 126   2, 6, 9-10

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

To show the second equality above takes a little effort, although for γ 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