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 \( (\mathbb{C}, +, \cdot, \prec) \) is an ordered field.

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) \( \text{Re} \frac{1}{z} > \frac{1}{2} \)
   b) \( |z^2 - 1| = \alpha, \alpha > 0 \)

P. 2. Let \( M = \{x \mid 0 \leq x \leq 1, x = 0.x_1x_2x_3x_4 \ldots \text{ where } x_i \text{ odd} \} \) 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 \( \{z_n\} \to \zeta \). Show \( \frac{z_1 + z_2 + \cdots + z_n}{n} \to \zeta \).

3.1 Page 33  2-7
3.2 Page 43  1, 3-4, 6-12, 14-15, 17, 19, 21
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 $0, 1, \infty$, 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 $f : D \to E, f(0) = 0, f'(0) > 0$.
P. 1. Verify the parenthetical comment on page 98:

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