1. Text Exercise 2.4.4

2. Text Exercise 2.5.1

3. Text Exercise 2.5.2

4. Text Exercise 2.5.3 (a) & (c)

5. Text Exercise 2.5.4

6. Suppose $\sum_{n=1}^{\infty} x_n$ is conditionally convergent, and define

$$a_n = \max\{x_n, 0\}$$
$$b_n = \min\{x_n, 0\}$$

   Show that $\sum_{n=1}^{\infty} a_n$ and $\sum_{n=1}^{\infty} b_n$ are both divergent.

7. (A bit more challenging) Find an infinite collection of closed discs $D_1, D_2, D_3, \ldots$ in the plane with centres $c_1, c_2, c_3, \ldots$, respectively, such that

   (a) Every line in the plane intersects at least one of the $D_i$, and

   (b) The sum of the areas of the $D_i$ is finite.

   (hint: Let $c_n = \sum_{k=1}^{n} 1/k$. Think about covering the positive $x$-axis with disks having centres $(c_n, 0)$ and radii which ensure the disks overlap. Then apply this same construction to the remaining sections of the axes.)