

Required Part:

1. Exercise 1.9.6 on page 21
2. Exercise 1.9.19 on page 23
3. Exercise 1.9.43 (a) (c) (e) on page 27
4. Let A_1, A_2, \dots and B_1, B_2, \dots be subsets of Ω .

(1) Show that

$$\left(\liminf_{n \rightarrow \infty} A_n\right) \cup \left(\liminf_{n \rightarrow \infty} B_n\right) \subset \liminf_{n \rightarrow \infty} (A_n \cup B_n)$$

(2) Show by example that the inclusion “ \subset ” in part (1) can be strict.

Optional Part (no need to hand in):

5. Exercise 1.9.3 on page 20
6. Exercise 1.9.4 on page 21
7. Exercise 1.9.5 on page 21
8. Exercise 1.9.7 on page 21