- 1. Carothers 1.4
- 2. Carothers 1.11
- 3. Carothers 1.15
- 4. Carothers 1.21
- 5. Carothers 1.24
- **6.** Suppose  $\limsup_{n\to\infty} x_n = -\infty$ , as defined in terms of eventual upper bounds. Show that

$$\overline{\lim}_{n\to\infty}x_n=-\infty,$$

as defined in the text.

- 7. Let  $(r_n)$  be an enumeration of  $\mathbb{Q} \cap [0,1]$ . Show that  $\limsup n \to \infty = 1$ .
- **8.** Prove that

 $\limsup x_n + \liminf y_n \le \lim \sup (x_n + y_n) \le \lim \sup x_n + \lim \sup y_n$  so long as neither of the right- or left-hand sides are of the form  $\infty - \infty$ .

9. Carothers 1.36